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Positive Interventions: Developing a Theoretical Model to Guide Their Development and Use

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Positive Interventions: Developing a Theoretical Model to Guide Their Development and Use

Abstract

The burgeoning field of positive psychology, which is the scientific study of how individuals and organizations flourish and what makes life worth living, is primarily descriptive and nomothetic. However, it has spawned several prescriptive exercises (i.e., positive interventions) for improving well-being. A common theoretically based definition for a positive intervention does not exist in the current literature. More importantly, although the interventions have shown some success, they have been developed with little thought to theory, such that the mechanisms that make such interventions successful are unknown. The aims of this paper are several-fold: First, I review the importance of theory in general, especially as it pertains to the development and application of positive interventions. Second, to provide a basis for developing good theory, I review criteria that have been proposed for evaluating existing theories and characteristics that differentiate among theories of human behavior and behavior change. Third, I provide an overview of existing behavior and behavior change theories that may be relevant to the development and application of positive interventions. Finally, I propose a new definition of a positive intervention and recommend a theoretical framework for the synthesis and application of positive interventions. Based on this review, I propose a theoretically-based hybrid model, which combines elements of self-determination theory and the health action process approach as a framework for positive interventions moving forward. Altogether, this work sounds a clarion call for the adoption of a rigorous, theory-based, and scientific approach to the design, development, and application of positive interventions.

Keywords

positive interventions, theories of behavior, theories of behavior change, self-determination theory, health action process approach

Disciplines

Health Psychology | Psychology | Theory and Philosophy

Positive Interventions: Developing a Theoretical Model to Guide Their Development and Use

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University of Pennsylvania

A Capstone Project Submitted

In Partial Fulfillment of the Requirements for the Degree of

Master of Applied Positive Psychology

Advisor: Margaret L. Kern, Ph.D.

December 7, 2014

Positive Interventions: Developing a Theoretical Model to Guide Their Development and Use

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Capstone Project
Master of Applied Positive Psychology
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December 7, 2014

Abstract

The burgeoning field of positive psychology, which is the scientific study of how individuals and organizations flourish and what makes life worth living, is primarily descriptive and nomothetic. However, it has spawned several prescriptive exercises (i.e., positive interventions) for improving well-being. A common theoretically based definition for a positive intervention does not exist in the current literature. More importantly, although the interventions have shown some success, they have been developed with little thought to theory, such that the mechanisms that make such interventions successful are unknown. The aims of this paper are several-fold: First, I review the importance of theory in general, especially as it pertains to the development and application of positive interventions. Second, to provide a basis for developing good theory, I review criteria that have been proposed for evaluating existing theories and characteristics that differentiate among theories of human behavior and behavior change. Third, I provide an overview of existing behavior and behavior change theories that may be relevant to the development and application of positive interventions, including the Theory of Reasoned Action, the Theory of Planned Behavior, Socio-Cognitive Theory, Transtheoretical Model of Behavior Change, Precaution Adoption Process Model, Health Action Process Approach, Prototype Willingness Model, and Self-Determination Theory. Finally, I propose a new definition of a positive intervention and recommend a theoretical framework for the synthesis and application of positive interventions. Based on this review, I propose a theoretically-based hybrid model, which combines elements of self-determination theory and the health action process approach as a framework for positive interventions moving forward. Altogether, this work sounds a clarion call for the adoption of a rigorous, theory-based, and scientific approach to the design, development, and application of positive interventions.

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TABLE OF CONTENTS

Section I.	Introduction	4
	• An Overview of Positive Psychology	5
	• Constructs of Psychological Well-Being	7
Section II.	The Importance of Theory and Theory-Based Interventions	10
	• The Importance of Theory in Interventions	11
	• Criteria for the Evaluation of Theories	13
Section III.	Distinguishing Among Theories of Behavior and Behavior Change	16
	• Type of Model	19
	• Model Assumptions	19
	• Level of focus	21
	• Processing Assumptions	22
	• Content	23
	• Summary	23
Section IV.	Review of Existing Theories	24
	• Theory of Reasoned Action (TRA)	24
	• Theory of Planned Behavior (TPB)	26
	• Social-Cognitive Theory (SCT)	28
	• Transtheoretical Model of Behavior Change (TTM)	30
	• Precaution Adoption Process Model (PAPM)	33
	• Health Action Process Model (HAPA)	36
	• Prototype Willingness Model (PWM)	38
	• Self-Determination Theory (SDT)	40
	• Summary	44
Section V.	A Theory-Based Approach to Positive Psychology Interventions	45
	• Existing Positive Interventions	45
	• Defining Positive Interventions	48
	• Key Elements of a Theoretical Positive Intervention Framework	50
	• A Recommended Framework for Design and Development	52
Section VI.	Conclusion	56
Section VII.	References	59
Section VIII.	Appendices	82

Positive Interventions:

Developing a Theoretical Model to Guide Their Development and Use

There is nothing as practical as a good theory.
(Kurt Lewin, 1951, p. 169)

From increases in positive emotion and greater life satisfaction to decreases in depression, anxiety, and illness symptoms, positive interventions that build pleasure, engagement, and meaning exhibit both short-term and long-term effects on well-being. (Parks, Schuller, & Tasimi, 2013, p. 970)

Introduction

There is much interest in positive interventions. The second quote above comes from the concluding remarks in *The Oxford Handbook of Happiness* (2013) review of positive interventions. The book's topics, length, and number of contributing authors speak volumes about how much the field of positive psychology has grown. Yet the field has moved forward while ignoring Lewin's comment – that good theory is essential for both good science and practical outcomes.

The impetus for this paper emanated from a meta-analytic review conducted by Sin and Lyubomirsky (2009) of 51 positive interventions. In both clinical and non-clinical samples, there was some evidence that positive interventions can enhance well-being and significantly reduce depressive symptoms. The good news was that positive psychology-based interventions worked. But I was left with a single question: How do they work? What are the mechanisms of action? Parks and Biswas-Diener (2013) recently surveyed the past, present, and future of positive interventions and reached the following conclusions: 1) there is no common definition of positive interventions, 2) there is no unifying theoretical framework for positive interventions, 3) unlike many areas of psychology, where theory drives research, positive psychology

interventions have focused on effectiveness, with few attempts to infuse them with theory, and 4) creating a single definition of positive interventions may be impractical.

In spite of this somewhat dismal account of the status of positive interventions, there are ample resources available to address the questions of “how” and “why” positive interventions work. This paper reviews these different streams of knowledge, and develops a new definition of a positive intervention, which is theoretically and empirically-based. I then recommend a theoretical basis for the design, development, and use of positive interventions going forward.

An Overview of Positive Psychology

The field of positive psychology was formally established as a sub-discipline of psychology in 1998 when Martin Seligman delivered his inaugural address as the President of the American Psychological Association. His call to action was to shift psychology’s focus from a curative, disease-based model to a preventative, strengths-based model, exploring what makes life worthwhile (Seligman, 1998, 2011). There are various definitions of positive psychology, such as the science of positive subjective experiences, positive individual traits, and positive institution (Seligman & Csikszentmihalyi, 2000), the science of flourishing and optimal functioning of individuals, groups, and institutions (Gable & Haidt, 2005; Linley, Joseph, Harrington, & Wood, 2006), or the scientific study of what makes life most worth living (Peterson, 2006). According to Peterson (2013), what makes life most worth living is not a psychological process; rather it is good work, good love, good play, and good service to others.

Several propositions underpin the positive psychology perspective (Peterson, 2013; Seligman & Csikszentmihalyi, 2000). First, what is good in life is just as real as what is bad – not secondary, derivative, epiphenomenal, or otherwise illusory and suspect, but valuable in and of itself. Second, what is good in life is not simply the absence of what is bad, problematic, or

unhealthy. And third, the good life requires its own explanation, rather than reconfiguring theories of disease and disorder.

One of the early strategies for establishing positive psychology as an empirically based field was to select and recruit prominent scholars with well-regarded reputations and scientific research acumen (Seligman & Csikszentmihalyi, 2000). One of the unintended consequences of aligning with highly regarded well-being researchers has been that happiness and well-being related constructs have become the de facto outcome measures for work in positive psychology (Biswas-Diener, 2011), rather than broader correlated outcomes that are valued by society, such as physical health, productivity, and social responsibility (Friedman & Kern, 2014). Although personal happiness and well-being (however these constructs are defined) are a worthy focus for positive psychology, some scholars argue that they are disproportionately valued over other possible outcome measures (Diener & Diener, 2011). Most positive intervention research is focused on the individual (Parks & Biswas-Diener, 2013). Biswas-Diener and colleagues (2011) argue for broadening the focus of research to include outcome measures at the group-level such as trust, friendship, and feelings of connectedness. In short, recent criticisms from both within and outside the field of positive psychology have called for both a broader focus on outcome measures and targeted populations (e.g., dyads, groups, organizations), and for the application of positive psychology to create social change.

As a sub-discipline of the broader psychological field, the science of positive psychology requires developing theories and evaluating these theories with evidence. Peterson (2013) stated, “positive psychology will rise or fall on the science on which it is based” (p. 4). Thus far, research defining the ‘good life’ has been considerable. As of 2013, over 18,000 documents had been identified for the field of positive psychology, with more than 2,300 being published in

2011, accounting for more than 4% of the PsychINFO database for that year (Rusk & Waters, 2013). The field now has multiple journals dedicated to publishing research on positive psychology. Most dominantly, *the Journal of Positive Psychology* focuses on furthering research and the development of good practice (tandfonline.com, 2014) and *the Journal of Happiness Studies* is an interdisciplinary journal dedicated to the scientific understanding of subjective well-being (springer.com, 2014). On the applied side, there are a growing number of practitioners trained in positive psychology. But the scientific approaches to intervention and application are somewhat haphazard, with little guidance or oversight of best practices.

Positive psychology began as a descriptive branch of psychology, but has bordered on becoming prescriptive. The extent to which its prescriptive claims are valid are unclear. Numerous activities and interventions generally falling under the positive psychology umbrella have not been evaluated empirically, and the field as a whole borders at times on self-help strategies and pseudoscience. In addition, there has been a separation between hedonic and eudaimonic components of well-being, with one stream focusing on affective science (including positive and negative emotions), and one focused on the broader conceptualization of the good life. Definitions of both happiness and well-being are important starting points for developing and evaluating positive interventions.

Constructs of Psychological Well-Being

Throughout history, people have questioned the nature of happiness, and philosophers have offered different perspectives on its nature, whether and how happiness can be increased, and what makes a good life. In the early 1900s, William James called for a new branch of psychology to study optimal human functioning (Pawelski, 2013). Maslow (1968) first used the term “positive psychology” to describe his study of fully-functioning and healthy people. Jahoda

(1958) conceptualized mental health and positive functioning as being comprised of: 1) attitudes of the individual toward oneself, 2) self-actualization, 3) integration, 4) autonomy, 5) perception of reality, and 6) environmental mastery.

Over the past three decades, leaders in the field have each suggested their own models of well-being. For example, in the 1980s, Diener and colleagues defined subjective well-being as one's cognitive and affective evaluations of one's life, and is typically comprised of three measures; positive affect, negative affect, and the degree of life satisfaction (Diener, Lucas, & Oishi, 2002). Ryff describes a multi-dimensional, poly-theoretical model of psychological well-being that includes 1) autonomy, 2) environmental mastery, 3) personal growth, 4) positive relations with others, 5) purpose in life, and 6) self-acceptance (Ryff & Singer, 2002). Seligman (2011) recently suggested a model containing five measurable elements of what free people will choose for their own sake and together contribute to overall well-being: 1) positive emotions, 2) engagement, 3) relationships, 4) meaning, and 5) accomplishment, or PERMA. Huppert and So (2013) defined 10 elements of flourishing: 1) competence, 2) emotional stability, 3) engagement, 4) meaning, 5) optimism, 6) positive emotions, 7) positive relations, 8) resilience, 9) self-esteem, and 10) vitality. Ciarrochi, Kashdan, and Harris (2013) describe seven "foundations" of well-being: 1) functional beliefs, 2) mindfulness, 3) perspective taking, 4) values, 5) experiential acceptance, 6) behavioral control, and 7) cognitive skills. Regarding happiness, Haidt (2006) maintains that it cannot be found, acquired, or achieved directly: "It is worth striving to get the right relationships between yourself and others, between yourself and work, and between yourself and something larger than yourself" (p. 239). One has to get the conditions right (e.g. love, work, and connectedness) and then wait for happiness to emerge from "between."

Another approach to the science of well-being focuses on elements that contribute to well-being. Most dominantly is self-determination theory (SDT; Deci & Ryan, 1985, 2000), which emphasizes the socio-contextual factors that either nourish and provide support for the satisfaction of one's needs for autonomy, competence, and relatedness, or that lead to their deprivation and resulting alienation and ill-being (Ryan & Deci, 2000). Although principally known as a theory of motivation (e.g. extrinsic vs. intrinsic, autonomous, or self-determined), SDT also envelops human development and optimal functioning (i.e. flourishing) with its concept of the essential nutrients required for positive motivation, experience, enhanced performance, and well-being (Deci & Ryan, 2000). These nutrients or supports are ambient to a person's context or environment and, influence and shape their world.

Theories of well-being, as described above, as well as others, share some overlapping constructs (emotions/affect, relationships, goals/meaning/purpose) and seem to converge on a multidimensional view that optimal well-being (or flourishing) results from the pursuit, fulfillment, and integration of several elements. Notably, the theories themselves are based upon the theorists' underlying philosophies, and are indicative of the worldview of the scholars and researchers associated with and supportive of their preferred model (Ciarrochi, Kashdan, & Harris, 2013). These assumptions impact not only the proposed models, but also the researchers' views on the purpose and mechanics of positive interventions. For example, Seligman (2011) notes: "Well-being is a construct, and happiness is a thing. A "real thing" is a directly measurable entity...[T]he elements of well-being are themselves different kinds of things" (p. 24). Seligman's assumptions reflect a philosophy of elemental realism, wherein it is possible to know the true nature of reality and objectively identify and quantify the elements of which it is composed.

Models and theories are true to the degree that they accurately predict what is actually observed (Atkins, 2012). Many disciplines of natural science are built upon assumptions of elemental realism, with results that tend to be both rational (e.g. logical or well-reasoned) and linear, and reflect a nomothetic view of individuals and their study. Psychology has adopted much from traditional science. Yet I suggest that contextualism, which is rooted in the action of the organism in context and emphasizes functionality (Pepper, 1942), is more appropriate for positive psychology. Contextualism is associated with a functional, pragmatic, or instrumental view of the world that does not seek correspondence between elements and forces of a given model, but rather asks “how best to manipulate the antecedents and consequences to achieve the desired goals?” Pragmatic contextualism aligns with William James’ (1890) notion of “the ‘instrumental’ view of truth... the view that truth in our ideas means their power to ‘work’” (p. 165). Pragmatic contextualism is likely to be more *useful* in the context of synthesizing positive interventions. Theories that may help to explain how and why positive interventions work are the subject for the remainder of this paper.

The Importance of Theory and Theory-Based Interventions

The American Psychological Association (2014) defines theory as an organized set of concepts that explain a phenomenon or group of phenomena. Bem and de Jong (1997) define theory as an organized and interrelated set of concepts and statements that relate to reality. According to Michie, Johnston, Francis, Hardeman, and Eccles (2008), theory represents an integrated summary of hypothesized causal processes that are involved in a change of behavior. Higgins (2004) states that the primary function of theory is to be generative, that is, to give rise to new ideas and discoveries. Thus, theories can predict and explain phenomena and generate testable hypotheses. Lippke and Zieglermann (2008) suggest that when comparing theories for

effectiveness, or calling for their rejections or refinement, one needs to establish whether or not they were tested properly. The next section of this paper first discusses the importance of theory in interventions, and then reviews three sets of criteria that have been proposed for evaluating theories.

The Importance of Theory in Interventions

Lippke et al. (2008) describe the need for theories in order to explain and predict behavior, as well as for the design and evaluation of interventions. They note:

Theories need to be empirically testable in two ways. Theories need to specify a set of changeable predictors to describe, explain, and predict behavior changes, and they should enable us to design an effective intervention that produces exactly those changes in behavior that are predicted by the relevant theory (p. 698).

Many scientists believe that the best way to discover effective interventions is to conduct research based on a theory of behavior or behavior change (Prochaska, Wright, & Velicer, 2008). Michie and Abraham (2004) posited that unlike “theory-inspired” interventions, theory-based interventions utilize an explicit causal pathway, which may assist intervention developers to avoid making implicit causal assumptions that lack sufficient evidence.

In a study designed to identify and link behavioral change techniques with theoretical constructs, Michie et al. (2008) advocated three main reasons why a theory should be used as the basis for designing interventions. First, interventions are more likely to be effective if they target the causal determinant of behavior and behavior change. This requires understanding the theoretical mechanisms of change. Second, theory can be tested and developed by evaluations of interventions only if they are informed by theory. Third, theory-based interventions facilitate an understanding of what works and what does not work, and thus serve as a basis for developing

better theory across different contexts, behaviors, and populations. The authors also summarized two independent attempts to identify and simplify the number of empirically derived key determinants of behavior change (see Appendix A), which provides a taxonomy of behavioral change determinants and techniques that could be a useful resource for the development of theory-based interventions.

Similarly through their research on physical activity maintenance, Nigg, Borrelli, Maddock, and Dishman (2008) concluded that theory-based research allows for: 1) understanding of the mechanisms involved; 2) understanding the underlying reasons why a mechanism worked or failed; 3) understanding which mechanisms influenced short-term changes and long-term changes; 4) the identification of which mediators that an intervention should target; and 5) how the design of evaluations can determine why an intervention was successful or not. When applied properly, theories of behavioral prediction and behavioral change make it possible to identify beliefs underlying a person's intention to perform (or not to perform) any given behavior (Fishbein & Capella, 2006). Taken together, these researchers make a substantive case for the importance of theory to guide and advance research, and for the development of theory-based interventions.

In a recent analysis of Nobel Prizes awarded over two decades in the fields of physics, chemistry, and medicine, considerably more awards were given for contributions to method than for contributions to theory (Greenwald, 2012). Yet the analysis underscores the importance of theory. Theories were often essential in enabling the development of award-winning methods. Further, award-winning methods frequently generated previously inconceivable data, which then inspired previously inconceivable theories. Greenwald acknowledges that conducting research without reference to theory would be blasphemous, and that good theory has the power to

illuminate and comprehend novel phenomena, and to also guide practical and valuable applications, especially when coupled with good methodology. Research in general, and theory development in particular is an iterative process, wherein the relationship between the data generated and the theoretical refinements is reciprocally interdependent. Based on Greenwald's findings, it may be prudent to explicitly add methodology to that equation.

Criteria for the Evaluation of Theories

Various criteria have been suggested for evaluating of a theory's usefulness and value (cf. Wittmann & Klumb, 2006 for a detailed discussion on state-of-the-science testing of theories). A first set of criteria was proposed by Lippke and colleagues (2008):

- 1) The theory demonstrates convergent, discriminant, and predictive validity for the key concepts.
- 2) The concepts should be theoretically based or embedded.
- 3) The aim of the theory should not only be to explain and predict behavior, but also serve as guide for changing behavior.

The authors further suggest that when comparing the effectiveness of theories (e.g. in meta-analyses or literary reviews) or when calling for their rejection or refinement, one first needs to discern whether or not they were tested properly.

Higgins (2004) noted five characteristics of a good theory:

- 1) Testable: A good theory has to be formulated in a way that its claims can be tested and validated, or disconfirmed. By being testable it is more useful, inspires other research, and is more generative.
- 2) Coherent: A good theory has to be understandable and non-contradictory so that clear predictions can be made using it. Coherence also improves generativity.

- 3) Economical: The simplest theory is preferable among competing theories. Economy, or parsimony, contributes to both coherence and testability, and hence also improves generativity.
- 4) Generalizable: What matters most is that a good theory is not bound or constrained by the data with which it began, but can be applied to new domains. By being generalizable, a theory is also more generative.
- 5) Explain known findings: A good theory should explain known phenomena, including contradictory phenomena. No known findings should contradict the theory. In addition, a theory should be able to generate new data. By being able to explain known findings, a theory is also more generative.

In summary, a good theory is testable, coherent, economical, generalizable, and explains known findings. Higgins does not consider being generative to be one of the essential characteristics of a good theory, but good theories will generate new ideas and discoveries. He contends that scientists are in the business of making discoveries, not testing hypotheses.

Prochaska and colleagues (2008) suggested 12 criteria, listed in a hierarchy that ranges from the least to the most difficult tests for theories of behavior change. The hierarchy is based on a philosophy of science that posits that theories should be evaluated with riskier tests (Meehl, 1978), wherein riskier implies a greater likelihood of failure. Table 1 summarizes these criteria, with details in Appendix B. According to Prochaska et al. (2008) the hierarchy was also ordered along the dimensions of increasing usefulness in practice and in value for enhancing health. The authors applied this hierarchy to the Transtheoretical Model of Behavior Change (TTM; Prochaska, 1979), from the perspectives of both advocates and critics of TTM.

Table 1*Hierarchy of Criteria for Theory Evaluation (Prochaska et al., 2008)*

	Criterion	Brief Description
1	Clarity	Well defined terms that are operationalized, explicit, and internally consistent
2	Consistency	Components do not contradict each other
3	Parsimony	Explained in the least complex manner possible
4	Testable	The propositions can be tested and it has the potential to generate empirical evidence
5	Predictive Power	Empirically adequate when its theoretical claims can predict future events
6	Explanatory Power	Empirically adequate when its theoretical claims can explain past events
7	Productivity	Reveals new phenomena and generates new questions and ideas.
8	Generalizable	Applicable to other situations, places, and times
9	Integration	Set of constructs are combined in systematic and meaningful patterns
10	Utility	Provides service and is useable
11	Practical	Produces greater behavior change than a placebo or control group
12	Impact	Efficacy X reach, or reach X efficacy X number of behaviors changed

Based on this evaluation, the authors made several insightful conclusions. First, a theory cannot be evaluated adequately by a single study, whether supportive or not. Evaluating a theory requires examining an entire body of literature, including studies with both significant and non-significant results, results that may or may not support the theory. Second, greater weight should be placed on the higher criteria. The riskier the tests passed, the more likely the theory will be useful and valuable to the field. Third, predictions of correlational relationships represent the abundance of evidence for and against theories of behavior. Correlational studies are common because they are easier, more convenient, and less expensive than experimental studies. But an abundance of correlational results should not be the only criteria for evaluating a theory. Fourth, the development of theories should be an iterative process wherein theory drives empirical research and empirical data drive theory refinement. Finally, the proposed hierarchy of criteria

can be used to compare alternative theories and to evaluate the progress being made within, or by a single theory.

The three sets of criteria reviewed here serve as a starting point for considering how theories can be evaluated and compared, and also serve as framework against which theories can be developed and refined. These lists are not exhaustive, and considerable overlap between them exists. Other researchers and scholars may array the criteria in different orders, or develop their own new lists. I propose using Higgin's (2004) criteria (i.e., testable, coherent, economical, generalizable, and explains known findings) as a rule-of-thumb for getting one's bearings on a particular theory, and using Prochaska et al's (2008) more extensive criteria for evaluating and comparing theories that have garnered sufficient results to make such evaluations both robust and meaningful.

In sum, theory is a useful tool. It is developed through an iterative interchange between empirical data and testable formulations and hypotheses. Research that is not tied to precisely formulated theories may be aimed at discovering new ideas and phenomena, and therefore should not be discredited prematurely. But to be prescriptive, as positive psychology efforts are moving towards, theory plays a vital role. Positive psychology is a very young field embedded within a broader discipline that is also relatively young, compared to the humanities and other sciences. The enthusiastic development of positive interventions to help people function more optimally is certainly a worthwhile endeavor, and one which makes understanding the theories the interventions may be based on even more important.

Distinguishing Among Theories of Behavior and Behavior Change

Among the many behavioral change theories that have been developed, tested, and supported, several characteristics provide a way to categorize and distinguish various theories

and models: behavior versus behavioral change, continuous versus stage assumptions, level of focus, single versus dual processing, and content-free versus content-specific (Ajzen, 1998).

Table 2 summarizes the major behavior and behavior change theories, according to how they fit within each of these characteristics.

Table 2*Behavior Change Models, According to Distinguishing Characteristics*

Model/Theory	Type		Assumptions			Level		Processing		Content	
	Behavior	Change	Cont.	Stage	Ind.	Social	Eco.	Single	Dual	Free	Specific
Health Beliefs Model (HBM)	X		X		X			X			X
Theory of Reasoned Action (TRA)	X		X		X			X		X	
Theory of Planned Behavior (TPB)	X		X		X			X		X	
Protection Motivation Theory (PMT)	X		X		X			X		X	
Social Cognitive Theory (SCT)	X		X			X		X		X	
Self-Determination Theory (SDT)	X	X	X			X	X	X	X	X	
Health Action Process Approach (HAPA)		X	X	X	X			X		X	
Precaution Adoption Process Model (PAPM)		X		X		X	X	X		X	
Transtheoretical Model (TTM)		X		X			X	X		X	

Note. Ind = individual, Eco = ecological. References: HBM: Becker, 1974; TRA: Fishbein & Ajzen, 1975; TPB: Ajzen, 1985; PMT: Maddux & Rogers, 1983; SDT: Deci & Ryan, 1985, 2000; SCT: Bandura, 1977, 1986; HAPA: Schwarzer, 2008, Zieglermann, Lippke, & Schwarzer, 2006); PAPM: Weinstein & Sandman, 1992; and TTM: DiClemente & Prochaska, 1982; Prochaska & DiClemente, 1983.

Type of Model. First, some theories focus on describing factors that predict behavior itself, whereas others focus on behavior change - the processes individuals engage in when they change their behavior (Noar, Chabot, & Zimmerman, 2008). Table 2 summarizes models and theories falling into these two categories. For example, behavioral prediction theories include the Health Beliefs Model (HBM; Becker, 1974) and the Theory of Reasoned Action (TRA; Fishbein & Ajzen, 1975), and behavioral change theories include the Health Action Process Approach (HAPA; Lippke, Zieglermann, & Schwarzer, 2004) and the Precaution Adoption Process Model (PAPM; Weinstein & Sandman, 1992). Self-determination theory is the only theory that falls in both categories.

Model Assumptions. A very popular distinguishing characteristic is whether a theory or model can be categorized as being based on a continuum or a stage hypothesis (Weinstein, Rothman, & Sutton, 1998). *Continuum models* identify predictive variables (e.g., personality, beliefs, attitudes, and intentions) for a behavior or behavior change to occur (Velicer & Prochaska, 2008). Multiple variables are often combined in a regression model, and the likelihood of the behavior or behavior change to increase is calculated (Lippke et al., 2008). Continuum models generally assume that an individual's behavior is the outcome of their conscious intentions (e.g. the intention of intending to work out for at least 30 minutes five times a week leads to behavior; Schwarzer, 2008). From this perspective, interventions aim at moving individuals along a continuum from beliefs and attitudes to intentions, which theoretically result in behavior (Armitage & Conner, 2001; Fishbein & Ajzen, 1975). In contrast, *stage models* hypothesize that behavior change takes place in several discrete stages. Each stage is expected to be mutually exclusive and qualitatively different from the other stages (Schwarzer, 2008; Weinstien et al., 1998), such that people at different stages exhibit different patterns of behavior.

Depending on which stage a person is in, certain social-cognitive variables are more important than they are in other stages. Interventions from this perspective need to be tailored to the stage a person is in (Sandman & Weinstein, 1991). The identification of discrete stages, along with which stage a person is at, is critical for stage-matched interventions to produce better outcomes (Schwarzer, 2008). As summarized in Table 2, models such as the Theory of Reasoned Action and Protection Motivation Theory are continuum models, whereas the Transtheoretical Theory Model and the Precaution Adoption Process Model are stage models. The Health Action Process Approach is the only model that falls into both categories.

Both approaches have received various criticisms. The traditional continuum theories and models have been criticized primarily because of the gap that often occurs between intention and behavior (Sheeran, 2002). Research on the adoption of health-protective behaviors suggests that health behaviors are too complex to be summarized by a single decision rule typical of continuum models (Baranowski, 1989-1990; Prochaska & DiClemente, 1983; Safer, Tharps, Jackson, & Leventhal, 1979; Weinstein, 1988; Weinstein & Sandman, 1992). In addition, the factors that predict people initiating action are typically not sufficient to explain successful or unsuccessful maintenance of a behavior (Leventhal, Diefenbach, & Leventhal, 1992; McCaul, Glasgow, & O'Neil, 1992). Stage theories and models have been criticized primarily on their assumption of discontinuity (Weinstein, 1993).

The continuum and stage model distinction can be considered two extremes, and some theorists prefer looser terminology and definitions. For example, in the Theories of Behavior and Theories of Behavior Change, stages represent a temporal dimension over which people evolve. Weinstein (1993) points out that the distinction between static and dynamic separates researchers who search for a single prediction rule from researchers who see behavior change as the

conclusion to a sequence of stages, with different issues and prediction rules involved at each stage. From an applied perspective, the question to ask may be when a continuum, stage, or hybrid model is most effective in creating change.

Level of Focus. A third defining characteristic of theories and models is their level of focus or approach with respect to an individual, his or her social context, and the surrounding environment. The philosophical assumptions are closely related to the level of focus. Most common theories focus on the individual and/or *intrapersonal* level (Nigg et al., 2008). This level of focus is consistent with elemental realism, in that the factors that determine behavior can be identified and known, behavior can be predicted from them, and models and theories (e.g. PERMA, theory of reasoned action, theory of planned behavior) are true to the degree that they accurately predict observed behavior, that is, demonstrate correspondence between predictions and observations, or account for variance (Atkins, 2012). In contrast, social cognitive theory (Bandura, 1998) focuses on the *interpersonal* and/or *social* level, incorporating the individual, their behavior, and their environment. This level of focus is consistent with pragmatic contextualism, in that individual behaviors are considered within a broader social context. As such, models and theories (e.g. social-cognitive theory, self-determination theory) are true to the degree that they are useful and effective in achieving a desired outcome, such as a change in behavior (Atkins, 2012). Models such as SDT and PAM focus on the *ecological* level, which highlights the individual's interactions with their physical and sociocultural environments, wherein the individual shapes their environment, and is shaped by his or her environment (McLeroy, Bibeau, Steckler, & Glanz, 1988). This level of focus is also consistent with pragmatic contextualism. This broader ecological perspective considers many potential sources

of barriers. For example, PAM considers the social environment and community structures (e.g. walking or biking pathways) that influence physical activity.

Processing Assumptions. A fourth defining characteristic for theories and models is whether they are based on, or incorporate single or dual information processing and decision-making pathway assumptions. Single models of cognition specify that information processing and decision making follow cognitive, analytic, and rational processes of deliberative and systematic reasoning. Single models are analogous to conscious processes that an individual can be aware of, intentionally initiate and guide, and have control over (Levesque, Copeland, & Sutcliffe, 2008). For example, theories of attitude-behavior consistency that rely on an expectancy value perspective (i.e. analytic processing) for decision making, such as protection motivation theory and the theory of reasoned action are single-processing models.

Dual-processing models of cognition maintain that two qualitatively different modes of information processing operate in decision-making (Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008). Unlike single-process models, non-conscious processes are ones that individuals are unaware of, are unintentionally initiated and guided, and are not controlled by the individual (Bargh, 1994). They operate in parallel to the conscious analytic decision-making process typical of single-process models. Non-conscious processes are usually associated with automatic functions, and are sometimes considered undesirable because they lack deliberation - a notion that is neither correct nor useful (Levesque et al., 2008). Burton, Lydon, D'Alessandro, and Koestner (2006) were able to prime intrinsic self-regulation that lead to greater psychological well-being 10 days later. Dual process models include the prototype willingness model and fuzzy-trace theory. For example, in cognitive-experiential-self theory (Epstein 1973, 1994), the analytic system is described as being effortful, logical, and deliberate, whereas the experiential

system is described as being impulsive, intuitive, and image-based. The fuzzy-trace theory (FTT; Renya, Lloyd, & Brainerd, 2003) posits that judgments and decisions are formed through two qualitatively different independent processes and that people base their decisions on mental representations that are encoded along a continuum of precision from “verbatim” to “gist” representations.

Content. A fifth and final defining characteristic for theories and models is the notion of whether they are content-free or content-specific (Ajzen, 1998). Content-free models include the TPB and SCT, and their main advantage is that they are applicable across behavioral domains. Content-specific models include the Perceptual Cognitive Approach (PCA; Leventhal, Leventhal, & Contrada, 1998) and HBM. The major advantage of a content-specific model is that it is customized to carry more information that is directly relevant to a particular behavior, and may further the understanding of the behavior in question. The major disadvantage of content specific models is that they require the construction of a different model for each domain of behavior one intends to study. Content-free models thus offer a more flexible framework for the development of intervention strategies.

Summary. In summary, this section highlighted five characteristics which one could use to distinguish or categorize different theories or models: 1) behavioral prediction or behavioral change prediction, 2) continuum or stage assumptions, 3) level of focus (e.g. intrapersonal, social/interpersonal, or ecological) and related philosophical view (e.g. elemental realism or pragmatic contextualism), 4) single or dual modes of information processing and decision-making, and 5) content-free or content-specific. Of these characteristics, the one attracting the most debate and disagreement in the literature appears to be whether a theory or model is continuum or stage based. Whether the process of behavior change is a series of qualitative

stages or an underlying action-readiness continuum (Abraham, 2008) is matter of judgment and beliefs, and is not a useful guide. Rather, it is probably more useful to be guided by some of the criteria for evaluation that have been proposed, and to determine if the research question being asked or, the intervention being planned is best served by one model or another.

Review of Existing Theories

To provide a framework for theory-based positive interventions, I next review major behavior and behavior change theories that may be applicable to positive psychology, and provide recommendations about their suitability for the design, development, and delivery of positive interventions. The theories reviewed include the Theory of Reasoned Action, the Theory of Planned Behavior, Social Cognitive Theory, Transtheoretical Theory Model, Precautionary Adoption Process Model, Health Action Process Approach, Prototype Willingness Model, and Self-Determination Theory.

Theory of Reasoned Action (TRA)

The theory of reasoned action (TRA) was first developed to separate the influences of attitudes, behavioral intentions, and behaviors from one another, rather than relying upon attitude-behavior linkages to predict behavior. A visual representation of the model is presented in Appendix C. TRA is a parsimonious model with only two variables predicting behavioral intentions, which in turn lead to behavior: an individual's attitudes and subjective norms (Fishbein & Ajzen 1975). Attitude refers to the positive or negative value associated with performing a target behavior. Subjective norms are perceptions of social pressures to perform or not perform a target behavior. Factors and influences from outside of the model are relevant to the extent they affect either attitudes or subjective norms.

Underlying attitudes and norms are a person's beliefs, which affect intentions and subsequent behavior. Behavioral beliefs determine an individual's attitude toward performing the behavior. They reflect the relationship between a target behavior and an individual's expected outcomes. Normative beliefs determine an individual's subjective norm about performing the behavior, and reflect the perceived behavioral expectations of significant others. The original authors specified three boundary conditions that affect the strength of the relationship between intentions and subsequent behavior: 1) the degree to which the measure of intention and the behavior criterion correspond with respect to their levels of specificity, 2) the stability of intentions between the time of their measurement and the performance of the behavior, and 3) the degree to which carrying out the intention is under the volitional control of the individual (Madden, Ellen, & Ajzen, 1992). A major assumption of the TRA is that the behaviors studied are under the full volitional control of the individual.

TRA has been used widely to predict behavioral intentions, and/or behavior (Madden et al., 1992). A meta-analysis of the TRA noted that the model predicted behavioral intentions and behavior quite well, and was useful for identifying opportunities for modifying behavior (Sheppard, Hartwick, & Warsaw, 1988). A study testing the predictive validity of people's intentions for condom use found the most significant relationship was between increasing intentions and higher levels of previous condom use, rather than the main antecedents of intention formation (Kashima, Gallois, & McCamish, 1993).

The greatest limitation of TRA is that it does not include variables such as self-efficacy and prior behavior. According to Oulette and Wood (1998), previous behavior is arguably the strongest single predictor of future behavior. A meta-analytic review of 72 studies using the TRA and TPB suggested that self-efficacy explained considerable variance in intention, and the

inclusion of past behavior resulted in the attenuation of the attitude-behavior, attitude-intention, self-efficacy-intention, and self-efficacy-behavior relationships (Hagger, Chatzisarantis, & Biddle, 2002). Although including some important components, based on evidence reviewed, I do not recommend TRA as a suitable platform for guiding the design and development of positive intervention.

Theory of Planned Behavior (TPB)

The theory of planned behavior (TPB) is an extension of TRA that adds a third variable: perceived control over an individual's behavioral achievements (see Appendix C for a path diagram of the model). It has the following characteristics: predicts behavior, continuum assumptions, intrapersonal focus and elemental realism philosophy, single model processing, and content-free. Like TRA, intention indicates an individual's readiness to perform a behavior. Intention reflects one's attitude, subjective norm, and beliefs about a behavior, and mediates between these three variables and a behavior (Ajzen, 1985). But the theory also includes perceived behavioral control (PBC) as a direct predictor of behavior (Ajzen, 1985, 1998). PBC is analogous to Bandura's (1977) concept of perceived self-efficacy, and represents an individual's belief in their own resources and abilities to perform a behavior and to persist and succeed when adversities are encountered. The PBC concept is consistent with other empirical results showing that an individual's behavior is strongly influenced by the degree of confidence they have in their own ability to perform a target behavior (Bandura, Adams, Hardy, & Howells, 1980).

Research demonstrates that TPB explains significantly more variation in both behavioral intentions and target behaviors than TRA (Hagger et al., 2002). The inclusion of PBC significantly enhances the prediction of both behavioral intentions and the target behaviors (Madden et al., 1992). The results suggest that strategies for changing behavior can follow an

indirect path through changing behavioral intentions, or a direct path to behavior by modifying an individual's belief in their control, or their actual level of control over the behavior. A meta-analytic review (Armitage & Conner, 2001) of 185 independent studies published through 1997 found that TPB accounted for only 39% of the variance in intentions, and 27% of the variance in behavior. Still, although TBP accounts for more variance in intentions and behavior than TRA, it still is problematic for predicting behavior and behavior change. A second meta-analysis, focused on longitudinal studies using the TBP model, found that past behavior accounted for 26 per cent of the variance in subsequent behavior (Sutton & Sheeran, 2003). Other researchers (Thompson, Zana, & Griffin, 1995) have proposed that properties of variables within the TPB may moderate the TPB-behavior relationship, such as intention certainty (Bassili, 1995), affective-cognitive congruence of attitudes (Rosenberg, 1968), and attitudinal ambivalence (i.e. when a person is equally likely to give an attitude object equally strong positive or negative evaluations; citation). There is considerable evidence that intention certainty, affective-cognitive congruence of attitudes, and attitude ambivalence all moderate the attitude-behavior relationship (Cooke & Sheeran, 2004).

The major criticisms of TPB include its limited predictive value (Sniehotta, 2009), its lack of post-intentional variables (Schwarzer, 2009), and its need to be made more powerful through the addition of predictors more proximal to the target behavior, such as action planning to mediate the intention-behavior gap (Sheeran, Milne, Webb, & Gollwitzer, 2005). Thus, I do not recommend TPB as a suitable platform for guiding the design and development of positive intervention.

Social Cognitive Theory (SCT)

Social-cognitive theory (SCT; Bandura, 1986) is a process approach to understanding human cognition, emotion, motivation, and behavior that assumes people are active in shaping their environments, rather than being passive reactors (Bandura, 2001). It has the following characteristics: behavior and behavior change prediction, continuum assumptions, interpersonal level of focus and pragmatic contextualism philosophy, single model processing, and content-free. Appendix C provides a path model of the main model. According to the model, self-efficacy can directly influence behavior and indirectly influence behavior through acting on (a) physical, social, and self-evaluative outcome expectations; (b) impediments or barriers; or (c) proximal goals. Each of these are antecedents to a target behavior (Bandura, 1994).

SCT includes four basic premises. 1) People have powerful cognitive abilities to create internal models of experience, develop innovative courses of behavior, hypothetically test and evaluate such courses of behavior through the prediction of outcomes, and communicate complex ideas, beliefs, and experiences to others. 2) Environmental factors, behaviors, and inner personal factors (e.g., cognition, emotion, and biological processes) have interactive influences on each other. Through cognitive processes, people exercise control over their own behaviors (i.e. self-regulation), which in turn influences the external environment as well as people's internal cognitive, affective, and biological states. 3) The concepts of "self" and "personality" are embedded in the social context. They represent perceptions of people's (self and others) patterns of social cognition, emotion, and behavior that occur in patterns of social situations, and are also developed and change as a result of social interactions. 4) People are capable of self-regulatory behaviors. They select goals and regulate their behavior in the pursuit of those goals. People have the capability to anticipate future consequences and to develop expectancies about them by

using previous knowledge and experiences to form beliefs about one's own abilities and future behaviors (Maddux, 2009). In summary, SCT describes behavior as a reciprocal process between a person and his or her environment, creating a framework that incorporates one's self-perceptions, beliefs, and expectancies about one's environment.

SCT addresses both the "sociostructural" and personal determinants of health. Implicit in Bandura's (1991) rendering of SCT for health promotion is the assumption that the practices of entire social systems have detrimental effects on individual health, and therefore will need to be changed. Focusing narrowly on the health habits of individuals is insufficient. SCT, in its totality includes factors governing the acquisition of competencies that can affect an individual's physical and emotional well-being, as well as the self-regulation of health habits (Bandura, 1991).

SCT also speaks to the development of self-efficacy beliefs and a sense of agency from early childhood through adulthood, as people continue to integrate information derived from four main sources of influence: (1) mastery experience, (2) vicarious experiences, (3) verbal persuasion, and (4) physiological and affective states (Bandura, 1977). Mastery experiences represent previous successes of accomplishing task, and are typically considered the strongest source of self-efficacy beliefs. Vicarious experiences occur by observing other people successfully perform difficult or complex tasks, and self-efficacy is increased through observation and social modeling processes. Verbal persuasion is when an external person tries to convince a person of their ability to successfully perform a task. Physiological and affective states are based on personal assessment processes. If the assessment results in negative affect, then self-efficacy and performance may be diminished. If the assessment results in positive affect, it may increase a person's sense of readiness, capabilities, and performance. Positive

affect may also activate memories of prior successes that subsequently increase self-efficacy beliefs.

Self-efficacy beliefs occupy an important and pivotal regulatory role in the causal structure of SCT. Self-efficacy beliefs not only operate in their own right, but they also influence and act upon other determinants of regulated behavior (Bandura, 1977). Numerous researchers have demonstrated the relevance and importance of overall self-efficacy beliefs, as well as domain specific self-efficacy beliefs for the successful change and maintenance of many behaviors that are crucial to physical health, including diet, physical activity, stress management, safe sex, smoking cessation, overcoming other addictive behaviors, compliance with prevention and treatment regimens, and the early detection of illness or disease (e.g., Bandura, 1997; Maddux & Lewis, 1995). Self-efficacy has been demonstrated to influence quality of life measures in several studies (Cunningham, Lockwood, & Cunningham, 1991; Lev, 1997; Telch & Telch, 1986) and a meta-analysis of SCT-based interventions for adult cancer patients revealed significantly higher effect sizes for affective, social, objective physical outcomes and specific quality of life measures (Graves, 2003).

SCT-based interventions have shown strong efficacy in increasing positive health behaviors (Bartholomew et al., 1997; DeBusk et al., 1994) and maintaining them (Bernier & Avard, 1986; Desmond & Price, 1988). Thus, I recommend SCT as a potential platform for guiding the design and development of positive interventions.

Transtheoretical Model of Behavior Change (TTM)

The transtheoretical model of behavior change (TTM), also called the Stages of Change (SOC) model (DiClemente & Prochaska, 1982; Prochaska & Velicer, 1997) was developed as a process model of change, developed from 250 to 400 different psychological theories (Karasu,

1986). It has the following characteristics: predicts behavior change, stage assumptions, ecological level of focus and pragmatic contextualism philosophy, single model processing, and content-free. The TTM includes 15 theoretical constructs, 10 processes of change (POC), and five stages of change (SOC). The TTM is driven by five key assumptions (Prochaska et al., 1998): 1) behavior change is a process that unfolds through a series of stages or phases; 2) stages are stable but open to change; 3) change can be motivated by enhancing the pros or by diminishing the value of the cons of a change; 4) the majority of at-risk populations are not prepared for action; it is important to help people set realistic goals for progressing to the next stage; and 5) specific principles and processes of change need to be emphasized at specific stages for progress and change to occur.

TTM suggests a five stage process model, which entails a cyclic pattern of movement through specific, discrete stages, a common set of processes of change, and systematic integration between the stages of change and the processes of change (Prochaska, DiClemente, & Norcross, 1992). The five stages of change are believed to be independent and mutually exclusive, and are defined according to a person's past behavior and future plans. They are: 1) Precontemplation, when a person has no intention of changing within the next six months; 2) Contemplation, when a person intends to change within the next six months; 3) Preparation, when a person is planning to change in the next 30 days; 4) Action, when a person performs a behavior at a specified criterion within the last six months; and 5) Maintenance, when a person performs a behavior at criterion for more than six months and until five years. Depending on the type of behavior targeted (e.g. smoking abstinence) and/or study design (e.g. longitudinal), a sixth stage of Termination may be added for people who have performed successfully for at least

five years, are no longer tempted to relapse, and exhibit 100% self-efficacy to maintain the change (Prochaska et al., 2008).

There is an abundance of studies that have used the TTM and offer support for the stage model of behavior change (Lippke, Nigg, & Maddock, 2007). The developers of TTM are among the most cited psychology authors (Byrne & Chapman, 2005; Pendlebury, 1996). A meta-analysis on tailored interventions found that TTM was the most commonly used theory across a range of behaviors and found empirical evidence supporting stage-matched treatments (Noar et al., 2007). A TTM-based treatment program for smoking, diet, sun exposure, and mammography screening with 5,545 patients significantly impacted all four target behaviors (Prochaska et al., 2005). The findings suggest that TTM-based interventions may impact multiple behaviors simultaneously. Despite its popularity and success, the TTM has also received various criticisms. For example, Sutton (2005) argued that the stages may not be truly qualitative, and may instead be arbitrary distinctions within a continuous process. Others have pointed out that the passage of time may not be a suitable criterion for defining stages (Lippke, Zieglermann, Schwarzer, & Velicer, 2009). Abraham, Norman, and Conner (2000) noted that the TTM's stage classifications are questionable, and West (2005) concluded that the TTM should be abandoned altogether.

TTM's applications have focused primarily on the cessation of addictive or negative health behaviors (e.g. smoking, diet, sun exposure), which in principle may not be coherent or congruent with the tenets of positive psychology's focus on well-being. There is considerable empirical support for the concept of stages of changes for health behavior change, and for the use of stage-matched, or tailored interventions. In addition, TTM's ten processes of change may prove to be useful for further consideration (see Appendix D for complete descriptions). Yet the

results for TTM are mixed, and with 14 variables, TTM is a complex model for the design and development of positive interventions. However, given TTM's popularity and results of successful behavior change, I recommend TTM as a potential platform for guiding the design and development of positive interventions.

Precaution Adoption Process Model (PAPM)

The precaution adoption process model (PAPM) was developed as an alternative to most existing theories of individual preventive behavior, which viewed the adoption of precautionary behaviors (e.g. home radon testing) as movement along a continuum of action likelihood, and to develop recommendations for interventions to successfully encouraging radon testing (Weinstein & Sandman, 1992). PAPM has the following characteristics: predicts behavior change, stage assumptions, social or ecological level of focus and pragmatic contextualism philosophy, single model processing, and content-free. PAPM consists of seven distinct stages: (1) unaware of the issue, (2) aware of the issue but not personally engaged by it, (3) engaged and deciding what to do next, (4) planning to act, but have not acted yet, (5) decided not to act, (6) taking action, and (7) maintenance. Each stage represents qualitatively different patterns of beliefs, behaviors and experience. Different factors produce advancement between the stages, and transition factors depend on the specific transition. Stages 1, 2, 3, 4, and 6 are considered core to the model, while stage 5 represents an additional stage when the conclusion of the decision-making process is that action is not needed. Maintenance is not considered a core stage because for some actions, their performance completes the process (e.g. lifetime vaccination or removing asbestos), but generally is an important stage for most healthy behaviors (e.g., physical activity, healthy eating).

PAPM and TTM are both stage models. PAPM essentially adds unawareness and awareness but not personally engaged to the TTM's five-stage framework. The precontemplation stage in TTM includes both people who have never thought about changing their behavior and people who have thought about changing their behavior and concluded or decided that they either do not need to change or do not wish to change, TTM's contemplation stage may have "contemplators" who are undecided and "contemplators" who have decided to act, as compared to PAPM's distinctions between stage 3 "Engaged and deciding what to do" vs. stage 4 "Planning to act but haven't acted yet." PAPM adds ignorant as stage 1 "Unaware of the issue." PAPM does not include any references to a time frame, nor does it consider the influence of previous behaviors (Weinstein, Lyon, Sandman, & Cutie, 1998).

PAPM includes several main claims. First, stages represent meaningful distinctions among people. For example, the model suggests that people who have never thought about acting are different from people who have thought about acting and decided that it was unnecessary. Second, the factors that predict movement between stages differ at each stage of the adoption process for precautionary behaviors. That is, the factors that cause people to start thinking about whether they should act are not necessarily the factors that determine the outcome of their decision. Likewise, the factors that determine the outcome to act or not are not necessarily the same factors that determine whether a decision to act is actually carried out. Third, a person's perception of this or her own susceptibility has a strong influence on the decision to act or not. People are often reluctant to acknowledge that they are at risk because they tend to believe that they are less likely to have a problem as others in the same situation (Weinstein, Klotz, & Sandman, 1988). Belief about the likelihood of a problem is a powerful predictor for taking action, and intervention efforts often begin with making people aware of their risk. Fourth, the

behaviors and opinions of others have a strong influence of a person's responses to hazards and potential hazards. The more complex or taxing a decision is, the more likely people are to be swayed by the response of others. Fifth, interventions to facilitate transitions between stages need to be tailored to the specific stage at which a person is located.

The PAPM is unique in its development and application to precautionary or preventive behaviors that may be related to the existence of known and potential hazards. It has been applied to home radon testing (Weinstein & Sandman, 1992), osteoporosis prevention (Blalock et al., 1996), and Hepatitis B vaccination programs (Hammer, 1997) with supportive empirical results. PAPM includes peer and social influences, which are absent from several other theories (HBM, SEUT, PMT) that consider preventive behaviors as being determined solely by a person's beliefs about a potential risk. The PAPM identifies some of the variables that determine whether people proceed through its seven stages. Perceptions of personal susceptibility are crucial to a person's decision to take precautionary action, thereby moving from Stage 3 to Stage 6. Situational barriers and obstacles are thought to strongly influence the transition from planning to act (Stage 4) to acting, or adopting the behavior (Stage 6) (Weinstein et al., 1998).

PAPM was developed to address a particular type of health behavior change, precautionary action, and prevention. Prevention is a key concept within positive psychology, thus PAPM appears to be theoretically coherent with a focus on well-being. Empirical support for the adoption of preventive behaviors occurring in stages is strong. PAPM also adds the influence of peers at several stages, and how people use the behavior and attitudes of others to bypass making a decision on their own. Although PAPM has not been as popular as TTM in its application, it appears to be more theoretically sound. Thus I recommend PAPM as a potential platform for guiding the design and development of positive interventions.

Health Action Process Model (HAPA)

The health action process model (HAPA; Schwarzer, 2008) was developed specifically for health behaviors by attempting to merge the concepts of the action phase model (Heckhausen & Gollwitzer, 1987) with those of social-cognitive theory (Bandura, 1986). It has the following characteristics: predicts behavior and behavior change, hybrid assumptions (can be used as either a continuum or stage model), interpersonal level of focus and elemental realism philosophy, single model processing, and content-free. Appendix C provides a path diagram depicting the model. The HAPA is an open architecture, theoretical framework that has two layers: a continuum layer and a stage layer. In the continuum layer, HAPA provides a mediator model that can help explain social-cognitive processes involved in health behavior change. In the stage layer, HAPA provides a moderator model in which people are identified in one of three phases/stages (preintenders, intenders, or actors). These phase/stage distinctions may be useful for tailoring interventions in order to match theory-based treatments to phase/stage-specific groups. A unique feature of the model is the inclusion of phase-specific self-efficacy beliefs: motivational self-efficacy (formerly referred to as “action” and “pre-action” self-efficacy), maintenance self-efficacy, and recovery self-efficacy (Parschau et al., 2014; Schwarzer, 2008, 2009; Schwarzer, Lippke, & Luszczynska, 2011). The model has garnered empirical support for being used to describe, explain, and predict health behaviors (Schwarzer et al., 2011).

The HAPA has two main stages or phases: (1) a pre-decisional, motivation phase, which culminates in the formation of a behavioral intention; and (2) a post-decision, volitional phase, leading to actual health behavior. The HAPA is designed as a sequence of two continuous self-regulatory processes, goal-setting in the motivational phase, and goal-pursuit in the volitional phase (Schwarzer, 2009). In the pre-intentional motivation phase there are three variables: (a)

risk perception, or a person's perceptions of vulnerability for a certain condition or disease; (b) outcome expectancies, or a person's evaluation and balancing of pros and cons of a certain behavior and outcome; and (c) perceived self-efficacy. In the post-intentional volitional phase there are five variables: (a) social support, (b) action planning, (c) coping planning, (d) maintenance self-efficacy, and (e) recovery self-efficacy.

The HAPA has five major assumptions that distinguish it from other models. First, the framework includes both motivation and volition phases. People develop goals and intentions in the motivation phase, and then pursue goals, initiate, and maintain action in the volitional phase. Second, the volitional phase contains two groups of people, which are characterized by different psychological states: those who have yet to translate their intention into action (intenders) and those who have (actors). Third, post-intentional planning is considered a volitional mediator between intentions and action (Gollwitzer & Sheeran, 2006). Fourth, the framework includes two kinds of mental stimulation: action and coping. Fifth, perceived self-efficacy is required throughout the change process, and differs functionally from phase to phase.

Because the HAPA includes many theoretical constructs in a dynamic manner, it requires more advanced statistical modeling and analysis, such as structural equation modeling (SEM) (Parschau et al., 2014; Schuz et al., 2005) and path analytic methods (Lippke et al., 2005; Luszczynska & Schwarzer, 2003; Renner et al., 2008). Despite this sophistication, the HAPA has been successfully applied to predicting and modifying a relatively wide range of health behaviors among diverse populations, including physical activity (Gellert, Zieglemann, Warner, & Schwarzer, 2011; Parschau et al., 2014; Schwarzer, Lippke, & Luszczynska, 2011), dietary behaviors (Renner et al., 2008) orthopedic and cardiac rehabilitation (Fleig, Lippke, Pomp, & Schwarzer, 2011; Lippke, Zieglemann, & Schwarzer, 2005; Scholz, Sniehotka, & Schwarzer,

2005; Zieglemann et al., 2006), smoking (Scholz et al., 2009), patients with multiple sclerosis (Chiu, Lynch, Chan, & Berven, 2011), and with people who have physical disabilities (Perrier, Sweet, Strachan, Latimer-Cheung, 2012).

Altogether, the HAPA framework appears to function particularly well for positive health behaviors. Thus, I highly recommended HAPA as a suitable platform for guiding the design and development of positive intervention.

Prototype Willingness Model (PWM)

The prototype willingness model (PWM) was created in an attempt to improve the predictive validity of existing health behavior theories by combining them with heuristic approaches to information processing and decision making (Gerrard et al., 2008). It has the following characteristics: predicts behavior, continuum assumptions, interpersonal level of focus and pragmatic contextualism, dual model processing, and content-free. PWM is one of two recent dual processing models, along with the Reflective and Impulse Model of Social Behavior (RIM; Strack & Deutsch, 2004), which has been applied to health risk decision-making. PWM specifically focuses on adolescent health risk decision-making that is image-based and involves heuristic processing, proposing a reasoned/analytical pathway and a social reaction/affective pathway. The primary difference between the social reaction and reasoned pathways appear to be the amount of pre-contemplation of the risky behavior and evaluation of its potential negative outcomes.

PWM asserts that the nature or risk-taking behavior and decision-making are social reactions to common risk-conducive situations (e.g., Gerrard, Gibbons, Stock, Vande Lune, & Cleveland, 2005; Gibbons & Gerrard, 1995; Gibbons, Lane, Gerrard, Pomeroy, & Lautrup, 2002). Further, children and adolescents have clear cognitive representations or social images

(i.e. prototypes) of the type of person who engages in specific risk behaviors (e.g. the “typical” smoker, drinker, or persons who engage in unsafe sex; Cantor & Mischel, 1979; Setterlund & Niedenthal, 1993; Snortum, Kremer, & Berger, 1987). These images are categorical, representing a typology rather than a description of physical appearances. PWM also asserts that the evaluation of the risk prototype (i.e. attractiveness or unattractiveness) shapes a person’s willingness to engage in the behavior. The more favorable the image, the more willing the person is to accept the social consequences associated with the behavior, including being seen by peers as a prototype for that behavior. As young people gain experience with relevant behavior, intentions and expectations become better predictors of future behavior (Kashima, Gallois, McCamish, 1993; Reinecke, Schmidt, & Ajzen, 1996). Individual differences in the tendency to be planful also impact the extent to which adolescents engage in either analytic or image-based processing about risk behaviors, with planfulness being positively associated with greater analytic processing (Gerrard et al., 2008).

Although developed as a model for adolescent behavior, there are several reasons why PWM is also applicable to adult decision making. First, experiential thinking remains active in adulthood. The ratio of heuristic to analytic processing decreases with the transition to adulthood (Adler & Rosengard, 1996; Arnett, 2005), but the heuristic mode is more likely to be engaged when a decision has a strong emotional component (Gerrard et al., 2008). Second, the favorability of certain risk prototypes tends to increase in early adulthood when people are formulating their adult identities (Arnett, 2005). Third, young adulthood is a time when people are exposed to greater opportunities for health risk behaviors, including drug use, binge drinking, and risky sex.

Some support for the model has been found in both adolescent and adult samples. For example, adults trying to quit smoking were more successful when they distanced themselves from an unfavorable smoker image/prototype (Gibbons, Gerrard, Lando, & McGovern, 1991; Wills, 1981). Studies addressing unprotected sex have demonstrated decreases in the favorability of images/prototypes who engage in these behaviors and a subsequent decline in people's willingness to take sexual risks (Blanton et al., 2001; Thorton, Gibbons, & Gerrard, 2002). Similar results were obtained when the favorability of the image of the typical person who tans was derogated, adult participants' willingness to be exposed to UV rays decreased and the changed images mediated decreases in self-reported tanning behavior (Gibbons, Gerrard, Lane, Mahler, & Kulik, 2005).

Dual process models contend that behavior is determined by a mix of conscious (controlled) and automatic (nonconscious) processes (Barrett, Tugade, & Engle, 2004). Evidence supporting a nonconscious, reactive, heuristic path for information processing, decision-making, and behavior is growing. Research on the PWM supports both dual- processing and the role of prototypes play in decision-making, and to a lesser extent health behavior changes. The evidence for PWM is growing, but not yet compelling enough to be suitable for designing and developing positive interventions. However, researchers and practitioners should keep an open mind to incorporating nonconscious strategies (e.g. priming techniques) to enhance the effectiveness of positive interventions.

Self-Determination Theory (SDT)

Self-determination theory (SDT) examines human motivation, development, and well-being from a humanistic organismic perspective (Deci & Ryan, 2000, 2008). It has the following characteristics: predicts behavior and behavior change, continuum assumptions, ecological level

of focus and functional contextualism philosophy, single model processing (but also shown to be effective in dual model applications), and content-free. A path diagram of the theory is depicted in Appendix C. SDT is primarily concerned with explaining the psychological processes that promote optimal functioning, health, and well-being. SDT includes three main components: (1) differentiating types of motivation, (2) the basic psychological needs, and (3) individual level differences.

First, SDT distinguishes various types of external and internal motivations, which align along a continuum. At one end of the continuum is amotivation, or the absence of intention, motivation, and self-determination. People who are amotivated will disengage from a behavior or activity and eventually stop doing it. Next on the continuum is extrinsic motivation, which is regulated by external pressures and incentives. Extrinsic motivation leads to performing a behavior in order to receive a reward or avoid a negative outcome. When external pressures regulating a behavior become internalized by a person, then that behavior has become regulated through introjections, or regulated through guilt and ego-involvement. When a behavior is identified, it is performed because it is personally important and consciously valued. When a behavior is integrated, it has merged with other aspects of a person's self. Integrated regulations have been evaluated and brought into congruence with a person's other values, but the behaviors are still done to attain desired outcomes, rather than for their inherent enjoyment. At the top of the continuum is intrinsically motivated behavior, in which people perform the behavior or activity for the sheer pleasure and satisfaction that is derived from performing it. Such behavior has the greatest likelihood of satisfying humans' basic psychological needs for autonomy, competence, and relatedness (Deci & Ryan, 2000). The type or quality of a person's motivation is considered to be much more important than the amount or strength of motivation (Deci &

Ryan, 2000). People whose motivation is authentic (i.e. self-authored or endorsed) versus those who are controlled externally tend to have better performance, persistence, creativity, vitality, self-esteem, and overall well-being (Deci & Ryan, 1991, 1995; Nix, Ryan, Manly, & Deci, 1999; Ryan, Deci, & Grolnick, 1995; Sheldon, Ryan, Rawsthorne, & Ilardi, 1997).

Second, SDT posits that humans have three fundamental psychological needs that are innate, essential, and universal: autonomy, competence, and relatedness. Autonomy refers to volition and includes the need to self-organize and regulate one's own behavior, including the tendency to work toward inner coherence and integration among regulatory demands and goals. Human autonomy is reflected in the experiences of integrity, volition, and vitality that accompany self-regulated behavior (Ryan, 1993). Competence refers to the need to engage in optimal challenges and experience mastery or effectance in one's physical and social environments. Relatedness refers to the need to seek attachments and experience feelings of belongingness, security, and intimacy with others (Deci & Ryan, 2000). SDT maintains that these needs are part of human nature, are therefore innate, and categorically different from physiological needs, or drives. The research supporting SDT demonstrates that these needs are not learned, nor do some people develop stronger needs than others. Additional research in a variety of countries and cultures has confirmed the universality of the needs for autonomy, competence, and relatedness, and that their satisfaction or thwarting predicted psychological well-being across cultures (Deci & Ryan, 2008).

Third, SDT identifies two general individual level differences: (1) causality orientation and (2) life goals. Causality orientation is the outcome of an ongoing dialectic between people's needs and their social contexts, resulting in either the fulfillment or frustration of their basic psychological needs. It describes how people orient toward their social environment, thereby

affecting its potential for providing further need satisfaction. Life goals are acquired as a function of the degree to which a person's basic psychological needs for autonomy, competence, and relatedness have been fulfilled or frustrated over time. Life goals break into two categories: intrinsic aspirations and extrinsic aspirations (Kasser & Ryan, 1996). A person's emphasis on intrinsic life goals, as opposed to extrinsic life goals has been associated with greater health, well-being, performance, and purpose (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004).

SDT further assumes that humans are active, growth-oriented organisms with natural inclinations toward psychological coherence and an organized relation to a larger social structure. SDT was built upon the dialectical relationship between people and their social environments in which they attempt to satisfy their basic psychological needs. The natural tendencies toward developing internal integration (i.e. autonomy) and social integration (i.e. relatedness) require nutrients and supports from the social environment to fulfill the basic needs and function effectively. Social environments that are supportive of the needs for autonomy, competence, and relatedness are necessary for maintaining or enhancing intrinsic motivation, facilitating the internalization and integration of extrinsic motivation that results in a more autonomous orientation, and promoting or strengthening life goals and aspirations that continue to provide satisfaction of the basic psychological needs (Deci & Ryan, 2000).

Nearly 40 years of research and refinement of SDT has demonstrated substantial support for the theory. Studies find that motivation differs by type as well as strength, with different types of motivation being related differently to performance, creativity, behavior, well-being, physical and psychological outcomes including mental health (Deci & Ryan, 2000; Ratelle, Vallerand, Chantal, & Provencher, 2004; Ryan & Deci, 2000). Self-determination theory has far more research topics, applications and developments than are possible to describe in this paper.

In 2014, SDT's principal investigators and scholars, Edward L. Deci and Richard M. Ryan, were named as two of the "World's Top 30 Education Professionals" ranking 14 and 22, respectively (Global Gurus, 2014). They provide an up-to-date website (www.selfdeterminationtheory.org) that is replete with published peer-reviewed journal articles that focus on SDT Theory, 13 topics of basic SDT research, 9 domains of SDT applications, other applied domains, foreign language articles, and 17 categories of questionnaires designed to assess different constructs within SDT, some categories with multiple instruments. These resources are available for review and use for academic research (See Appendix E for more detailed information and Appendix F for discussions with Edward Deci).

Overall, SDT research indicates that having an autonomous style of self-regulation (i.e. being more self-determined) is associated with a host of positive behavioral outcomes and improved psychological well-being. Thus, I highly recommended SDT as a suitable theory for guiding the design, development, and application of positive intervention.

Summary

In sum, numerous models and theories have been proposed, studied, and used throughout the behavior and behavior change literature. Table 3 provides a summary of the models reviewed, along with recommendations for positive psychology interventions. Accordingly, I recommend that positive interventions be grounded in self-determination theory, and designed, tested, and applied using a hybrid SDT-HAPA framework, as proposed below.

Table 3*Summary of Theories Reviewed, with Recommendations for Positive Psychology Interventions*

Theory/ Model	Brief Description	Recommendation
Theory of Reasoned Action	Predicts behavioral intentions	Not recommended
Theory of Planned Behavior	Predicts behavioral intentions	Not recommended
Social Cognitive Theory	Predicts behavior & social learning	Recommended
Transtheoretical Model	Predicts behavior change	Recommended
PAPM	Predicts behavior change	Recommended
HAPA	Predicts behavior change	Highly recommended
PWM	Predicts behavior change	Not recommended
Self-Determination Theory	Predicts behavior and behavior change	Highly recommended

A Theory-Based Approach to Positive Psychology Interventions

With the importance of theory established and an extensive review of existing behavior change models provided, I now turn to providing a theory-based framework for positive psychology interventions, beginning with a general overview of existing positive interventions, providing a working definition for positive interventions, offering key theoretical considerations, and finally presenting a recommended framework for designing and implementing positive interventions.

Existing Positive Interventions

Parks and Biswas-Diener (2013) describe and discuss three broad conceptualizations of positive interventions: (1) they focus on positive topics, (2) they operate by a positive mechanism or target a positive outcome variable, and (3) they are designed to promote wellness rather than fix weaknesses. They further suggested that the primary goal of positive interventions is to build some positive variable or variables (e.g. SWB, positive emotions, meaning); there should be empirical evidence that the intervention manipulates the target variable(s); and there should be empirical evidence that improving the target variable(s) leads to positive outcomes in

the target population. The importance of being theory and evidence based are clearly missing from this proposed definition.

Parks and Biswas-Diener (2013) organize existing positive interventions into seven areas (strengths, gratitude, forgiveness, social connections, meaning, savoring, and empathy). Others have identified similar types of positive psychology interventions (e.g., Duckworth, Steen, & Seligman, 2005; Parks et al., 2013, Peterson, Park, & Seligman, 2005; Sin & Lyubomirsky, 2009). Table 4 summarizes the major, consistent approaches/ interventions that have received the most attention in the literature.

Table 4

Summary of Major Existing Positive Interventions

Intervention	Description
Building Pleasure and Positive Emotions	
Savoring	Bringing conscious awareness to pleasurable momentary experiences and trying to make them last longer
Loving-kindness meditation	Directing one's attention toward generating warm and tender emotions and then extending them towards others
Gratitude	Feeling that something good has happened combined with the awareness and acknowledgment that an external source is responsible
Building Engagement	
Signature strengths	Using one's signature character strengths in a new way every day
Social connections	Active and Constructive Responding with close others, or practicing "acts of kindness" with close friends or strangers
Flow & mastery	Balancing challenge and skills in a manner that leads to feelings of mastery and competence
Building Meaning and Purpose	
Expressive writing	Creating a coherent and meaningful narrative, which can improve self-regulation and goal success
Reminiscing	Thinking about and focusing on pleasant past memories leads to positive emotional experiences and greater life satisfaction

When considered collectively, these positive interventions, and related exercises, provide several insights: First, a common element they share is focused awareness, that is, the activation

and cultivation of awareness, or mindfulness, on the present, the past, or the future. Second, no two interventions appear to share a common theoretical base. The recommended exercises are largely standalone activities developed independently in order to demonstrate efficacy and empirical support. Third, a common definition of what constitutes a positive intervention does not emerge readily from these examples, although each conforms to definition promulgated by Parks et al. (2013).

Pawelski (2009) describes a generic methodological model for the synthesis of positive interventions that is comprised of five constitutive elements: (a) activity, (b) active ingredient, (c) target system, (d) target change, and (e) desired outcome (see Table 5). To synthesize a positive intervention, one starts with a desired outcome (goal) and reverse engineers an activity (positive intervention) to achieve that outcome or goal, by working backwards through the proposed methodology. Although Pawelski does not offer a definition of a positive intervention for consideration, the simplicity of the process is both heuristic and parsimonious.

Table 5

Proposed Process for Synthesizing New Positive Interventions

Desired Outcome	Target System	Target Change	Active Ingredient	Activity
<ul style="list-style-type: none"> • Greater happiness • Subjective well-being • Greater Meaning • Greater success reaching goals • Better relationship • More successful organizations 	<ul style="list-style-type: none"> • Affect • Attention • Will • Cognition • Memory • Physiology • Relationships • Organizations 	<ul style="list-style-type: none"> • Increased Self-efficacy • Increased Self-determination/intrinsic motivation • Increased Self-regulation • Shift of focus • More optimistic explanatory style 	<ul style="list-style-type: none"> • Autonomy • Competence • Relatedness • Mindfulness • Self-regulation • Disputation • Verbal Persuasion • Psychological and emotional states • Performance experiences • Vicarious experiences • Imaginal Experiences 	<ul style="list-style-type: none"> • Writing • Speaking • Thinking • Observing • Filling out forms • Playing a game • Behavioral task

Note. Model developed by James O. Pawelski, 2009. Reproduced with permission.

Defining Positive Psychology Interventions

Coming to a single definition of positive interventions is challenging. Parks and Biswas-Diener (2013) defined positive interventions as “an activity that successfully increases some positive variable, and that can be reasonably and ethically applied in whatever context is being used” (p. 161). As noted above, Sin and Lyubomirsky (2009) stated that positive interventions “are aimed at cultivating positive feelings, positive behaviors, or positive cognitions” (p. 1). To provide alternative perspectives, I collected, reviewed, and analyzed 25 definitions of a positive intervention that were developed by graduate students from the University of Pennsylvania’s 2014 class of Masters of Applied Positive Psychology program. These definitions suggested that positive interventions are evidence-based, intentional activities for increasing a person’s positive thoughts, emotions, behaviors, and overall well-being. Students also noted that positive interventions are those “resulting in the formation of habits” and achieving “a sense of flourishing.”

I propose the following working definition. Positive interventions are theory and evidence based techniques or activities designed to positively change the thoughts, emotions, and behaviors of an individual, members of a group or an organization, in order to improve their respective levels of happiness and well-being. This definition can be detailed as follows.

First, positive interventions should be scientific, meaning that theoretical, empirical, and experientially based models and methods should be applied systematically to understand how and why things work. By being theory-based, explicit causal processes can be identified and tested, ultimately leading to more effective interventions (Michie et al., 2008). By being evidenced based, best practices and guidelines can be developed, as researchers submit their findings to peer-reviewed professional journals, and processes and results are replicated by

others. As many positive interventions are often self-administered or administered by practitioners with varying degrees of expertise, ensuring their safety is important. Just because the aim is positive does not mean that there is no potential for harm. In addition, practitioners and lay people need to be able to differentiate and distinguish positive interventions from self-help exercises and folk remedies. An evidence-based foundation built upon scientific methods is therefore essential.

Second, positive interventions are designed to *change* thoughts, emotions, and behaviors in order to *improve* a person's happiness and well-being. With the focus on *change*, positive interventions should be based on theories of behavior change, rather than theories of behavior and behavioral prediction. *Improve* is a meliorative term that indicates the change is intended to make a person's existing levels of happiness and well-being better. Positive interventions have not typically been designed for, nor intended for treating or alleviating illnesses, or correcting deficient conditions. Positive interventions may be effective in reducing depressive symptoms (Parks, 2012; Sin & Lyubomirsky, 2009), and positive psychotherapy is showing promising results (Meyer, Johnson, Parks, Iwanski, & Penn, 2012; Parks, 2012; Rashid, 2013; Seligman, Rashid, & Parks, 2006), but stronger evidence about what and when positive interventions can be applied to clinical contexts needs to be developed.

Third, the definition includes "happiness" and "well-being" to point to both hedonic and eudaimonic aspects of well-being, and generally allows the many different conceptions of positive psychosocial outcomes to be included.

Fourth, the definition emphasizes positive change, rather than neutral state or a balance of both positive and negative experiences. Negativity biases are pervasive (Rozin & Royzman, 2001). Even when of equal intensity, things of a more negative nature (e.g. unpleasant thoughts,

emotions, social interactions, harmful/traumatic events, objects, or personal traits) tend to have a greater effect on one's psychological state and processes than do neutral or positive things. Because of the saliency of negative experiences, individuals, dyads, groups, and organizations will function better when the number of positive experiences outweighs the number of negative experiences (Driver & Gottman, 2004; Fredrickson & Losada, 2005). Further, the principle of loss aversion suggests that when losses and gains are directly compared to each other, losses loom larger than gains (Kahneman & Tversky, 1979; Kahneman, 2011). Thus, a positive intervention must transcend the pull of negative biases, experiences, and losses.

With this working definition of positive interventions in place, we now turn to key elements that inform a theoretical model of positive interventions.

Key Elements of a Theoretical Positive Intervention Framework

Beyond the many important change elements reviewed in the theoretical models above, characteristics and elements particular to positive interventions need to be considered. According to Aristotle (Melchert, 2002), James (1892/1950), Csikszentmihalyi (1990), and Pawelski (2003), volitional control and volitional action are key contributors for developing effective positive interventions. Aristotle's equation for the 'good life' and achieving enduring happiness was to forge reason with virtuous actions in order to form virtuous habits. For James, human's nature is volitional action and forming habits was essential for being happy. Csikszentmihalyi (1990) stressed the importance of volitional control to focus attention in order to shape one's mind, consciousness, and experience. Pawelski's (2003) pragmatism reinforces the importance of building habits on people's strengths in order to capitalize on the best in life and to flourish. In addition, positive interventions may be more effective if they intentionally target creating and

changing habits of thoughts, feelings, and behaviors; that is, incorporating positive intervention exercises into a one's daily or regular routines.

Several factors are proximal to the formation of an intention to change, and to the subsequent conversion of an intention into a change of thoughts, emotions, or behaviors. A chain of sequences can be envisioned, in which intention and perseverance are necessary to promote focused attention, focused attention promotes mindfulness, mindfulness promotes autonomy, autonomy promotes self-efficacy, self-efficacy promotes self-regulation, and self-regulation converts intentions into voluntary cognitive, affective, and behavioral changes. Each of these elements should be considered in terms of how they interact with each other.

Additional person-specific factors may also be important for developing effective positive interventions, such as goal setting and hope. When used constructively, goals can enhance positivity through increased self-efficacy and self-regulation. Goals can also enhance task interest, reduce boredom, and improve clarity of expectations (Locke, 1996). Hope has been described as an active ingredient in psychological change, a motivating force, and character strength. Hope energizes people to seek the best at the worst of times, and people rely upon hope to inform their goal-directed thinking (Lopez et al, 2004).

Content-specific factors that affect the use and efficacy of positive interventions also need to be considered. Both mediating variables, such as positive emotions, thoughts, behaviors and need satisfaction, and moderating variables, such as dosage, variety, motivation, effort, and age matter (Layous & Lyubomirsky, 2012; Lyubomirsky & Layous, 2013; Sin & Lyubomirsky, 2009). Individual preferences can alter the selection and acceptance of positive activities (Schueller, 2010). Individualized interventions are typically more effective than uniform "one-size-fits-all" approaches, such as through the use of interactive computer programs than can

tailor individualized intervention effectively and economically for large populations (Strecher et al., 1994). The relevance of “fit” between a person and an intervention impacts the efficacy of the activity, and it may be valuable to select or assign interventions that are concordant with a person’s personality, values, interest and goals (Sheldon & Lyubomirsky, 2006). However, the benefits of tailoring will depend on whether weak or strong psychosocial determinants of behavior are targeted (Bandura, 1998). Variety may not only forestall hedonic adaptation to an immediate increase in happiness or SWB resulting from a positive intervention, it may also predict greater long-term well-being for people using positive interventions (Sheldon, Boehm, & Lyubomirsky, 2013).

A Recommended Framework for Positive Intervention Design and Development

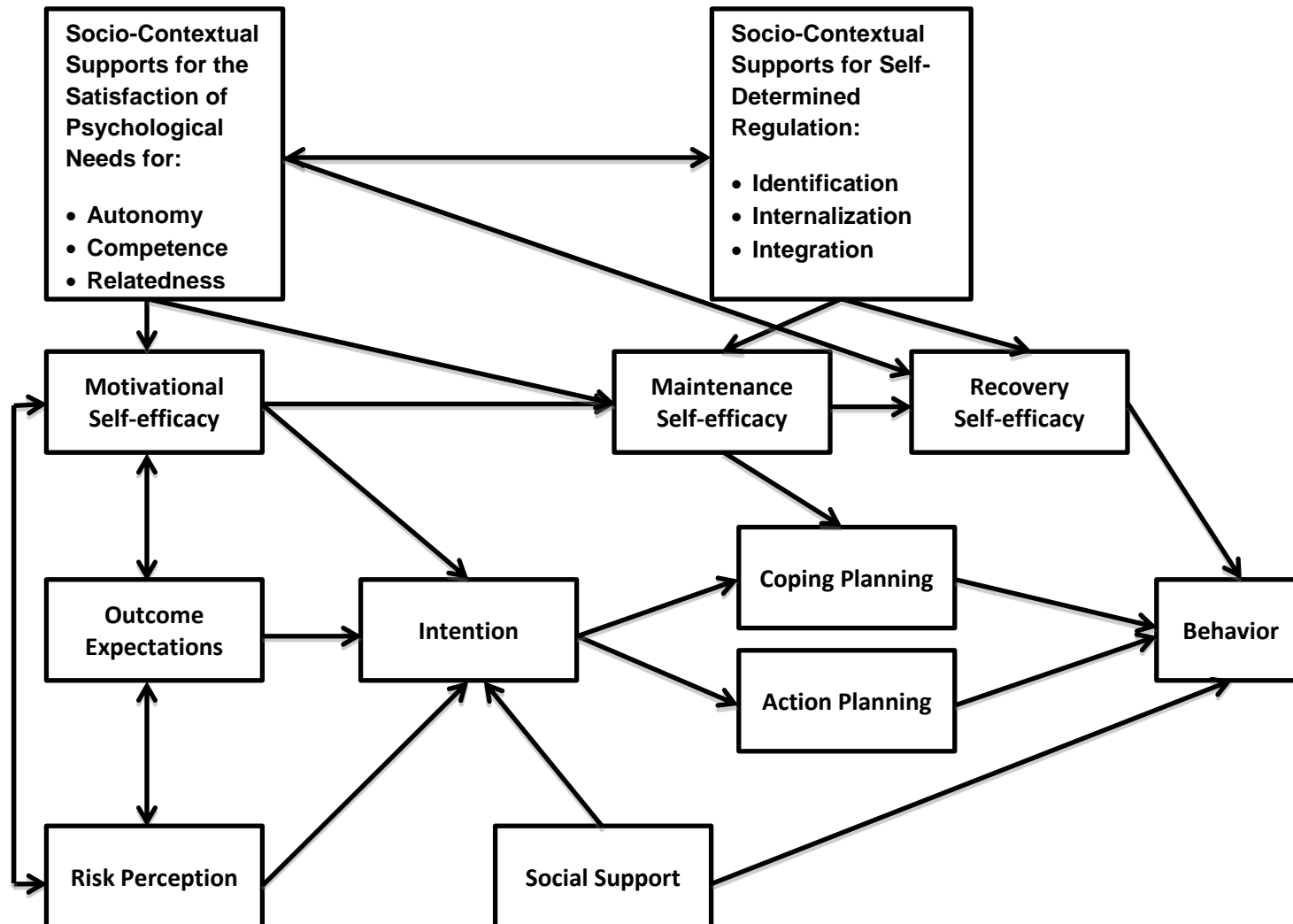
At the beginning of this paper, I noted that the impetus for this project was to provide a framework for understanding how positive interventions work. Bringing together the theoretical models reviewed, my definition for a positive intervention, and additional considerations for the development and use of positive interventions, I now suggest a guiding model or framework for positive intervention research and practice moving forward. A proposed hybrid model is depicted in Figure 1, which brings together key elements of SDT and HAPA to apply specifically to the positive intervention context.

As noted by Ajzen (1998), the major purpose of using any theoretical model is to improve our understanding of behavior and to help us design more effective interventions. He also noted that few profound insights have resulted from the application of theoretical models to health behavior “with the possible exception of the recognition of self-regulation, and especially self-efficacy, plays a major role in all aspects of health, illness, and recovery” (p. 735). The core of the proposed hybrid model depicted in Figure 1 is the HAPA framework. Layered onto it are

two major components from SDT: the socio-contextual factors that satisfy basic psychological needs (autonomy, competence, and relatedness), and the socio-contextual factors that support self-determined regulation of behavior (processes of identification, internalization, and integration). Both of the SDT components relate to and support the three phase-specific forms of self-efficacy in the HAPA framework, which in turn are critical for individuals to successfully transition from a pre-intentional motivational phase to a post-intentional volitional phase, and result in a targeted behavior change. A hybrid of the two models is appropriate because SDT identifies the necessary and sufficient conditions for building, maintaining, and enhancing self-efficacy, whereas HAPA identifies how different forms of self-efficacy are required at different stages in the process of behavior change, as well as the proximal determinants of intention formation and behavioral change. In short, HAPA helps to answer “how to?” questions, and SDT helps to answer “how come?” or “why?” questions.

The proposed theoretical framework begins with the Health Action Process Approach (HAPA). HAPA was specifically developed to target health behavior change, and it appears to be congruent with the essential character of positive interventions. The HAPA framework makes a theoretical and practical distinction between a motivational phase leading to the formation of an intention and a volitional phase leading to behavior change. Thus, it bridges the intention-behavior gap that is inherent in many other theoretical models by including post-intentional factors (Sutton, 2008). In addition, the HAPA framework has well defined and parsimonious sets of variables for each phase and includes social support as an environmental variable. The framework is flexible, with the ability to convert into an explicit stage model, even though stage-matched interventions may not be an important consideration for developing positive

interventions. Identifying subjects in different phases/stages would be particularly useful for designing phase/stage-tailored interventions.

Figure 1. Hybrid Model of SDT-HAPA for Positive Interventions

Although HAPA provides a good starting point, I suggest that alone it is insufficient to provide a guiding theory for developing positive interventions. Thus, my proposed model adds elements of SDT to the HAPA framework. At a macro level, SDT is a humanistic, organismic theory that provides a comprehensive account of human functioning as well as the processes that shape cognitive, emotional, and behavioral self-regulation and development. At a micro level, SDT considers the individual and their socio-contextual factors and conditions necessary for optimal growth, development, and functioning. SDT promulgates a positive view of human nature that is coherent and congruent with the tenets of positive psychology.

Applying the principles of SDT, positive interventions can be defined as theory and evidence based techniques or activities designed to satisfy basic psychological needs for autonomy, competence, and relatedness in order to positively change the thoughts, emotions, and behaviors of an individual, members of a group or an organization, and improve their respective levels of happiness and well-being. Utilizing this definition, SDT can help guide the synthesis of new positive interventions, and perhaps refine existing positive interventions, by answering these fundamental questions:

1. Which basic psychological need(s) is being targeted by the intervention: autonomy, competence, relatedness, or a combination thereof?
2. What socio-contextual and environmental factors (e.g. aspects of the client/therapist relationship) may positively (or negatively) influence the identification, internalization, and integration processes of a new targeted, extrinsic behavior (i.e. results of the intervention) from an external to an internal perceived locus of causality, that is, greater autonomous regulation?

3. What socio-contextual and environmental factors (e.g. sources of experiences of relatedness, competence, and autonomy) may promote (or diminish) intrinsic regulation and motivation for the new targeted behavior, such that it becomes inherently interesting, enjoyable, satisfying, and self-reinforcing?
4. How can the socio-contextual and environmental factors be manipulated to ensure the satisfaction of target populations' needs for autonomy, competence, and relatedness in order to establish and maintain an autonomous causality orientation for the individual(s)?
5. What influence does the targeted need(s) have on the content (i.e. the *what*) and process (i.e. the *why*) of a person's goal-directed behavior?

Conclusion

Human behavior is complex and change is hard. Examining how organismic processes are shaped, modulated, and modified by social factors has largely been the domain of social sciences, and psychology in particular. However, new multi-axis biological disciplines have emerged with techniques that can be used to demonstrate and elucidate the interactions between the structure and function of the brain and social contexts and processes. These developments underscore the fact that social and biological (neurological particularly) approaches to understanding human behavior are complementary, not antagonistic. The mechanisms underlying the mind and behavior are unlikely to be fully explicable by a social or biological approach alone. Rather, a more comprehensive understanding of the mind and behavior will require multi-level, integrative theoretical frameworks that span both the biological and social approaches to understanding, explaining, predicting, and changing human behavior.

For positive psychology to effectively change behaviors toward positive outcomes, the dynamic interaction between biological-neurological mechanisms and social contexts needs to be

embraced. This is a promising and influential time for positive psychology's development and maturation. Maintaining an integrative, multi-disciplinary approach to the scientific study of human flourishing and that which makes life most worth living is essential. Underlying all of this is the need for good theory. The proposed theoretical framework is only one of many that could be considered, but the information and recommendations here provide a foundation for taking positive interventions from haphazard activities to a rigorous, theory-based science that proactively investigates not only what activities seem to work, but also the complicated web of mechanisms and moderators involved.

Any theory or model itself is simply a starting place to be refined over time, through careful empirical testing and revision. I end with the wise words of Kurt Lewin (1951):

Enthusiasm for Theory? Yes! Psychology can use much of it. However, we will produce but an empty formalism, if we forget that mathematization and formalization should be done only to the degree that the maturity of the material under investigation permits at a given time. (p. 1)

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Appendix A

Key determinants of Behaviour Change from Fishbein et al., 2001; Michie et al., 2004 (see Original Publications for Definitions) (Michie et al., 2008, p. 664)

<i>Fisbein, Triandis, Kanfer et al., 2001</i>	<i>Michie, Johnston, Abraham et al., 2004</i>
Self-standards	Social/professional role and identity
	Knowledge
Skills	Skills
Self-efficacy	Beliefs about abilities
Anticipated outcomes/Attitude	Beliefs about consequences
Intention	Motivation and goals
	Memory, attention, and decision processes
Environmental constraints	Environmental context and resources
Norms	Social influences
	Emotion
	Action planning

Appendix B

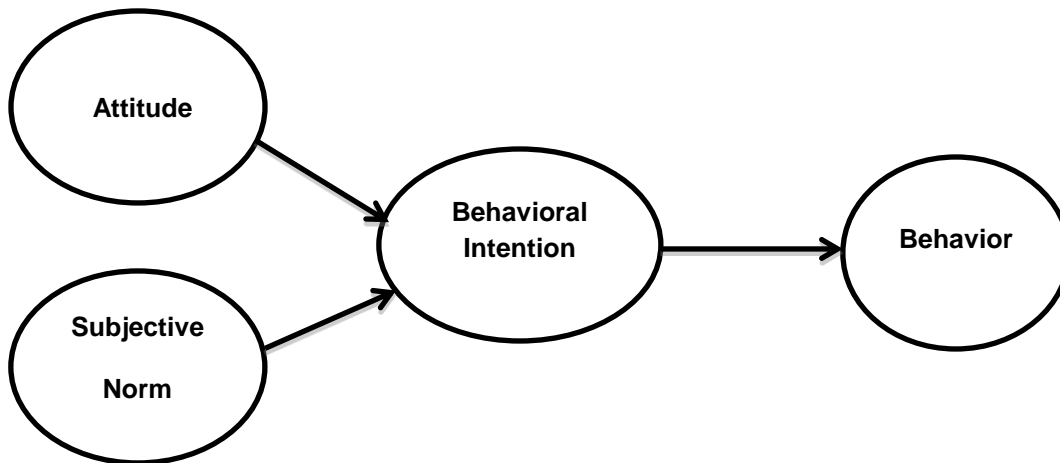
Hierarchy of Criteria for Theory Evaluation (Prochaska et al., 2008, p. 565)

1. Clarity: Has well defined terms that are operationalized and explicit, and internally consistent. Explicit propositions are preferred. Assumptions, Propositions, and concepts have definitions that are consistent, not redundant, and concepts have content and construct validity (Fawcett, 1995).
2. Consistency: The components do not contradict each other. The definitions are consistent with assumptions. There is fit between concepts and propositions and concepts and clinical exemplars.
3. Parsimony: Explained the phenomenon in the least complex manner possible. Complexity may be desirable if a number of concepts and relationships are needed to explain and predict.
4. Testable: The propositions can be tested. Has the potential to generate empirical evidence. Has the potential to be falsifiable or refuted.
5. Predictive Power: It is empirically adequate when its theoretical claims are congruent with evidence, e.g. explains why a behavior change occurred and why it did not, and predicts when a behavior change will and will not occur (Meleis, 1997). Empirical adequacy can be assessed retrospectively by examining explanatory power or prospectively by assessing predictive power; with the latter being the more powerful test. Explanation is a statement of present or past events and prediction is a statement of future events not yet observed (Reynolds, 1971).
6. Explanatory Power: It is empirically adequate when its theoretical claims are congruent with evidence, e.g. explains why a behavior change occurred and why it did not, and predicts when a behavior change will and will not occur (Meleis, 1997). Empirical adequacy can be assessed retrospectively by examining explanatory power or prospectively by assessing predictive power; with the latter being the more powerful test. Explanation is a statement of present or past events and prediction is a statement of future events not yet observed (Reynolds, 1971).
7. Productivity: Reveals new phenomena or relations among those already known. Generates new questions and ideas and adds to knowledge bases. It can build on previous research and generate the potential for future studies.
8. Generalisable: Generalises to other situations, places, and times. Related to the abstractness of the statements used. Extends far beyond particular observations and laws that it was designed to explain.
9. Integration: A set of constructs are combined in systematic and meaningful patterns, first conceptually, then empirically, and ideally mathematically.
10. Utility: Provides service and is useable.
11. Practical: A theory-based intervention is demonstrated to have significant efficacy, producing greater behavior change than a placebo or control group
12. Impact: Impact was originally defined as efficacy X reach (the percentage of a target population participating). Impact is now defined as reach X efficacy X number of behaviors changed.

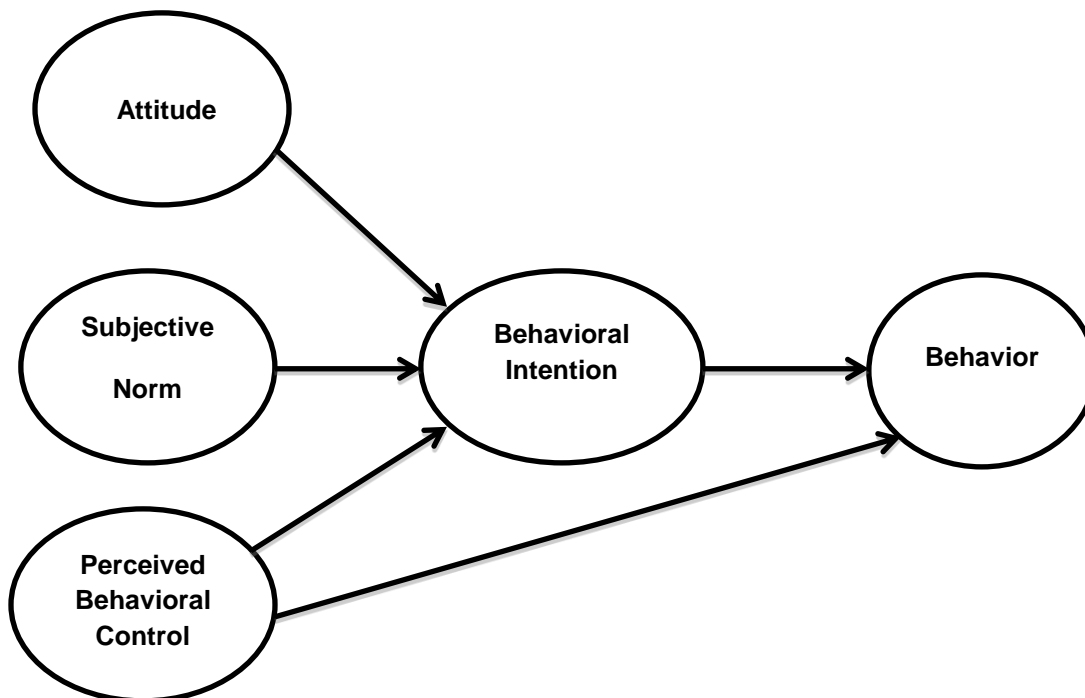
Appendix C

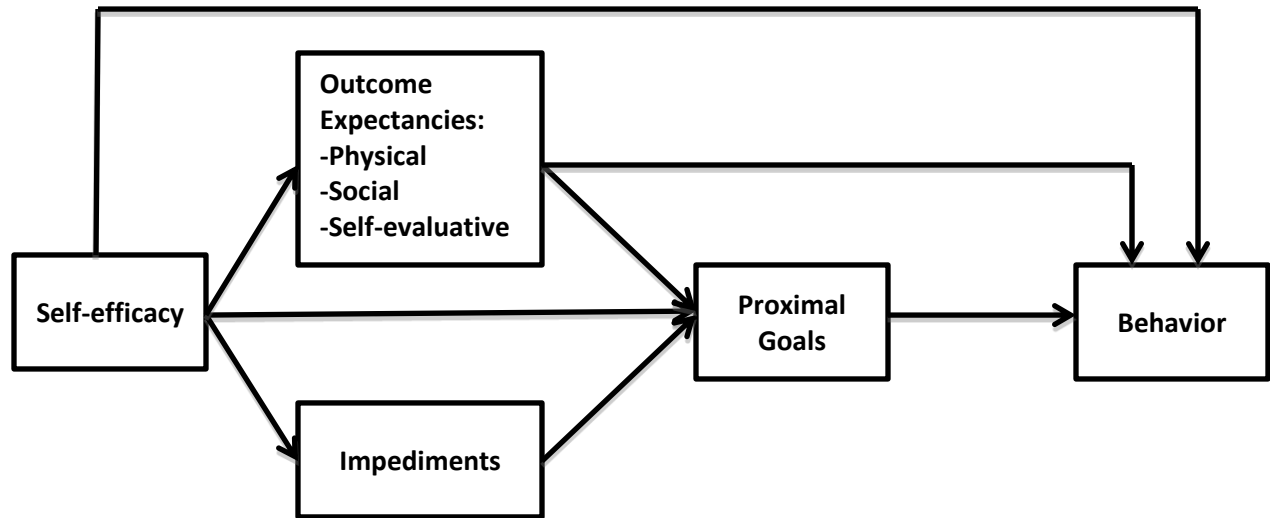
Path Models for Key Behavior and Behavior Change Models

The Theory of Reasoned Action (Fishbein & Ajzen, 1975).



The Theory of Planned Behavior (Ajzen, 1985).

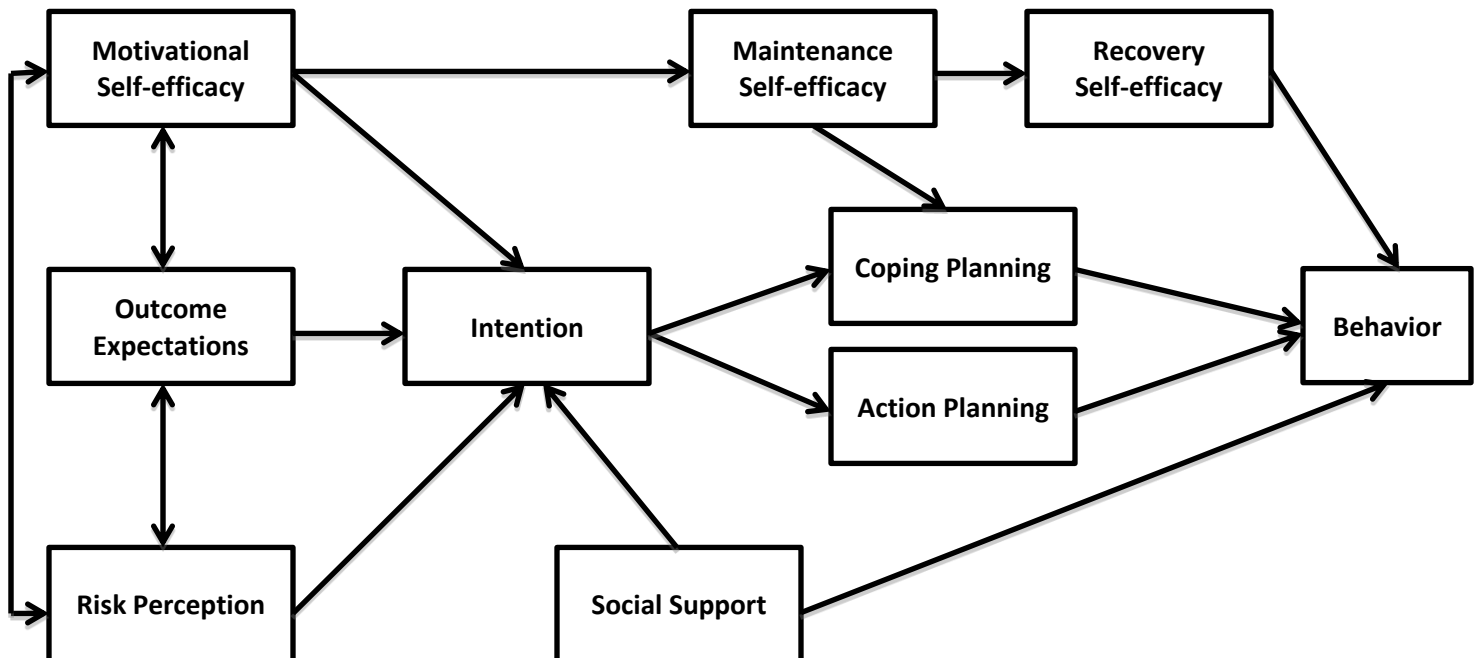


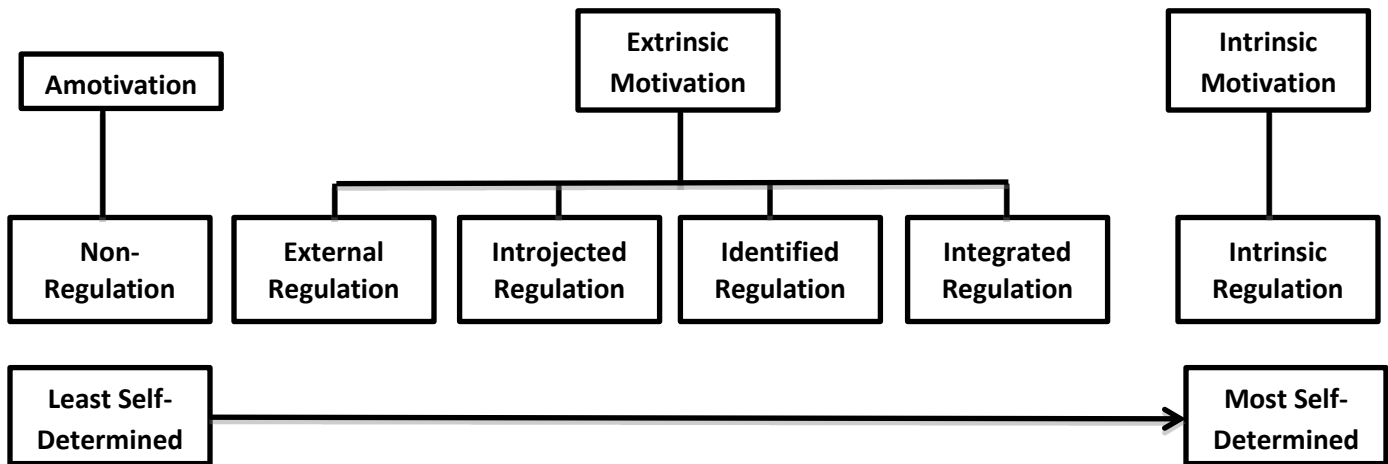
Social Cognitive Theory (Bandura, 1988)**Health Action Process Approach (Parschau et al., 2014)****Motivational Phase**

(Pre-Intentional)

Volitional Phase

(Post-Intentional)



Self-Determination Theory (Deci & Ryan, 2008; Ryan & Deci, 2000).Non Self-DeterminedSelf-Determined**Perceived Locus of Causality:****Impersonal****External****Somewhat
External****Somewhat
Internal****Internal****Internal****Relevant Regulatory Processes:****Non-intentional,
Non-valuing,
Incompetence,
Lack of Control****Compliance
External
Rewards and
Punishment****Self-control,
Ego-Involvement,
Internal Rewards
and Punishment****Personal
Importance,
Conscious
Valuing****Congruence,
Awareness,
Synthesis
With Self****Interest,
Enjoyment,
Inherent
Satisfaction**

Appendix D

TTM's Processes of Change

TTM's 10 processes of change are clusters of treatment strategies that were derived from Prochaska and DiClemente's (1983) analysis of 24 models of psychotherapy. They are subdivided into two groups, experiential and behavioral. The experiential POCs are:

1. **Consciousness raising** – or, getting the facts. A strategy to increase a person's awareness, and assimilation of new information about the causes, consequences, and cures for a target behavior;
2. **Dramatic relief** – or, paying attention to feelings. Increases a person's emotional experiences relative to the target behavior followed by a reduction in affect, or increase in anticipated relief if appropriate behavior is performed;
3. **Environmental reevaluation** – or, notice your effect on others. Cognitive and affective assessments of a person's behavior on their social and physical environments. Includes awareness that a person can serve as a positive or negative role model for others;
4. **Self-reevaluation** – or, create a new self-image or prototype. Cognitive and affective assessments of a desired future state or image, which can serve as the motivation to change and create an intention to change; and
5. **Social liberation** – or, notice social trends. A person's perceptions of whether their broader social context is supportive of their behavior or not (e.g. smoke-free zones, easy access to condoms, healthy food choices at schools and workplaces).

The behavioral POCs are:

1. **Self-liberation** – or, make a commitment. Includes the intention to change, a belief that a person can change, and a commitment to act on that belief;
2. **Counter conditioning** – or, use substitutes. Learning to substitute healthy alternatives for the problem behavior (e.g. nicotine patches as a safe substitute for smoking);
3. **Helping relationships** – or, get support from others. Developing social support for a desired behavior change (e.g. buddy-system, supportive calls, therapeutic alliance);
4. **Reinforcement management** – or, use rewards. Self-changers rely on rewards much more than punishment. Establish positive consequences and reinforcement for the performance of desired behaviors; and
5. **Stimulus control** – or, manage your environment. Removing cues for undesirable behaviors and add prompts for desired behaviors (e.g. for dieting/healthy eating, remove unhealthy foods and replace with healthy alternatives) (Prochaska et al., 2008).

Appendix E

Overview of resources available at: www.selfdeterminationtheory.org

PUBLICATIONS

The Theory

- Theoretical Overviews and Research Reviews

Basic SDT Research Topics

- Basic Psychological Needs
- Causality Orientations
- Development and Parenting
- Intrinsic Motivation
- Goals, Values, and Aspirations
- Internalization and Self-regulatory Styles
- Mindfulness
- Motivation and Self-Determination across Cultures
- Nonconscious Process and Priming
- Psychological Health and Well-being
- Relationships
- Self and Self-esteem
- Vitality and Energy

Applications of SDT

- Biological and Neuropsychological
- Education
- Environment (Sustainability)
- Health Care
- Organizations and Work
- Psychopathology
- Psychotherapy and Counseling
- Sport, Exercise, and Physical Education
- Virtual Environments and Video Games

Additional Categories

- Other Applied Domains
- Foreign Language Articles

QUESTIONNAIRES

- General Causality Orientations Scale
- Perceived Autonomy Support
- Self-Regulation Questionnaires (SRQ)
- Perceived Competence Scale (PCS)

- Intrinsic Motivation Inventory (IMI)
- Health Care SDT Packet (HC-SDT)
- Aspirations Index (AI)
- Basic Psychological Needs Scale (BPNS)
- Self-Determination Scale (SDS)
- Subjective Vitality Scale (VS)
- Motivators' Orientation
- Perceptions of Parents
- Christian Religious Internalization Scale (CRIS)
- Treatment Motivation Questionnaire (TMQ)
- Motives for Physical Activity Measure (MPAM-R)
- Mindful Attention Awareness Scale (MAAS)
- Problems in Schools Questionnaire: Adults' Orientation toward Control (PIS)

Appendix F

Edward L. Deci's Thoughts

Out of curiosity about the potential coherence or symmetry between positive psychology and self-determination theory, I exchanged emails (October 23, 2014) with Edward L. Deci, Ph.D, Professor of Psychology and the Helen F. & Fred H. Gowen Professor in the Social Sciences, University of Rochester, about the four things that make life worth living according to Christopher Peterson (2013) (i.e. the domains of work, love, play, and service to others). I asked Dr. Deci for his thoughts on how each domain may, or may not correspond with the satisfaction of the three basic psychological needs of autonomy, competence, and relatedness. The table below shows his responses in *italics*.

Peterson's Domains of Life Worth	Self-Determination Theory's Basic Needs
Work	<i>Competence, Autonomy, and Relatedness*</i>
Love	<i>Relatedness, Autonomy, and Competence</i>
Play	<i>Autonomy, Competence, and Relatedness**</i>
Service to Others	<i>Relatedness, Autonomy, and Competence</i>

* Regarding Work, the order of the basic needs really depends on the individual, the job he or she is doing, and their motivation for doing that job. (e.g. relatedness, through social exchange, being part of a team, or a sense of belonging could be the primary need being met).

** Regarding Play, the order of the basic needs is likewise dependent on the individual's motivation for playing, along with the type of play, and what is being played.

A key take-away from Dr. Deci's input was that each domain could satisfy all three psychological needs simultaneously if the activity being performed was intrinsically motivated and autonomously self-determined. Another key take-away was that the order of the needs being satisfied is generally determined by a person's motivation for engaging in the respective activity. For example, some people may choose to work or volunteer in order to satisfy their need for relatedness, rather than a need for competence. In addition, that the level of need satisfaction or

fulfillment was primarily determined by the type of motivation (i.e. the more intrinsically motivated the behavior, the greater the likelihood of need satisfaction) and secondarily by the level of regulation (i.e. the more autonomously regulated the behavior, the greater the likelihood of need satisfaction). A final take-away concerned the concept of self-determination itself; namely that self-determination does not mean “controlled” by the self but rather means endorsed by the self.

More recently, during a second email exchange with Dr. Deci, I requested his input on identifying how the basic psychological needs according to SDT may, or may not be satisfied by the eight positive interventions described by Parks et al. (2013), and whether SDT could explain why these positive interventions increase happiness and decrease depressive symptoms. His initial response was “It is not simple to take the 8 things (positive interventions) and assign each to a need. It depends on how they are done” (Personal communication with Edward L. Deci, Ph.D, November 16, 2014). The following list includes Dr. Deci’s responses in *italics*:

I. Building Pleasure - Enhancing Positive Emotions:

a) Savoring: bringing conscious awareness to pleasurable momentary experiences and trying to make them last longer.

Fundamental Need(s) Satisfied: *Depends on what the experience was. An experience of being successful at something would probably enhance competency and autonomy. If the experience was a nice interaction with another person, it would probably enhance relatedness and autonomy, and maybe competence about socializing*

b) Loving-kindness Meditation: directing one's attention toward generating warm and tender emotions and then extending them towards others.

Fundamental Need(s) Satisfied: *Relatedness and autonomy.*

c) Gratitude (Three Good Things or Gratitude Visit): feeling that something good has happened to oneself combined with the awareness and acknowledgment that an external source is responsible.

Fundamental Need(s) Satisfied: *Depends on the good thing that happened, but probably relatedness.*

II. Building Engagement - Absorption, Social Engagement, and Flow and Mastery states:

a) Using one's signature character strengths (Peterson & Seligman, 2004) in a new way every day.

Fundamental Need(s) Satisfied: *Autonomy and competence, possibly relatedness if it involves*

others.

b) Engaging in Social Connection: Active and Constructive Responding with close others, or practicing "acts of kindness" with close friends or strangers.

Fundamental Need(s) Satisfied: *Relatedness, autonomy, and competence.*

c) Flow and Mastery: A key criterion for experiencing flow is a balance between challenge and skills that leads to feelings of mastery and competence.

Fundamental Need(s) Satisfied: *Competence and autonomy, possibly relatedness depending on the experience.*

III. Building Meaning and Purpose - Expressing Clear Goals and Values Imbue Purpose:

a) Expressive Writing: benefits come from the creation of a coherent and meaningful narrative.

Disclosive writing about goals improves self-regulation, and goal success. Two specific exercises were "Best Possible Selves" and "Ideal Future Life".

Fundamental Need(s) Satisfied: *Autonomy, competence, and relatedness.*

b) Reminiscing: thinking about and focusing on pleasant past memories leads to positive emotional experiences and greater life satisfaction.

Fundamental Need(s) Satisfied: *Depends on what the memories are of, but would likely enhance autonomy, maybe competence, and maybe relatedness if it involves another.*

In summary, Dr. Deci's comments appear to indicate coherence between the key principles of SDT and how positive interventions work (i.e. via the satisfaction of basic psychological needs), and perhaps between SDT and positive psychology in general, if his comments are interpreted more broadly.

Christopher Peterson (2013) stated that positive psychology and "the good life requires its own explanation, not simply a theory of disorder stood sideways or flipped on its head" (p.4). One implication of this statement is that positive psychology may not have its own theory just yet. Peterson (2013) also stated that "Positive psychology will rise or fall on the science on which it is based" (p. 4). Self-determination theory (Deci & Ryan, 1985, 2000) is a scientific meta-theory of human motivation, functioning, development, and well-being. It clearly is not a theory of illness or disorder, even though it has been applied to the areas of psychopathology and psychotherapy. More importantly, SDT appears to be a solid theoretical foundation for guiding the design, development, and research of positive interventions, and perhaps also for grounding much of the work being done in positive psychology.